Vol. 1132 Number 4

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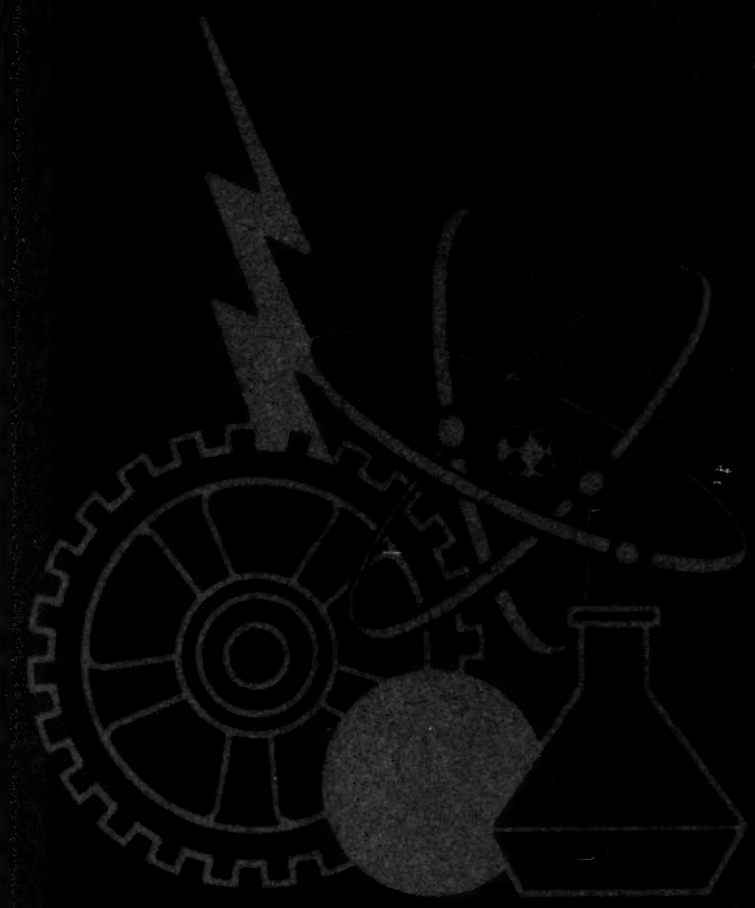
PATENTS

November 26, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	490.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	119.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	150.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

June 27, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on November 22, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,785,476 through 4,787,098
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 20, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,483,019 through 4,484,358
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 8, 1991 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,402,092	06/307,846	9/06/83
4,402,094	06/359,578	9/06/83
4,402,102	06/323,189	9/06/83
4,402,104	06/311,389	9/06/83
4,402,107	06/256,993	9/06/83
4,402,111	06/312,402	9/06/83
4,402,114	06/235,684	9/06/83
4,402,118	06/306,197	9/06/83
4,402,119	06/296,944	9/06/83
4,402,122	06/319,949	9/06/83
4,402,138	06/263,998	9/06/83
4,402,141	06/365,302	9/06/83
4,402,147	06/267,630	9/06/83
4,402,151	06/308,097	9/06/83
4,402,162	06/335,667	9/06/83
4,402,163	06/245,028	9/06/83
4,402,164	06/244,219	9/06/83
4,402,165	06/237,724	9/06/83
4,402,166	06/270,613	9/06/83
4,402,171	06/341,797	9/06/83
4,402,186	06/275,232	9/06/83
4,402,188	06/307,757	9/06/83
4,402,189	06/320,358	9/06/83
4,402,197	06/293,635	9/06/83
4,402,200	06/299,533	9/06/83
4,402,203	06/400,880	9/06/83
4,402,208	06/253,778	9/06/83
4,402,216	06/298,195	9/06/83
4,402,224	06/246,617	9/06/83
4,402,225	06/272,954	9/06/83
4,402,228	06/270,495	9/06/83
4,402,230	06/284,050	9/06/83
4,402,232	06/270,963	9/06/83
4,402,237	06/278,622	9/06/83
4,402,240	06/221,094	9/06/83
4,402,243	06/235,843	9/06/83
4,402,252	06/254,758	9/06/83
4,402,264	06/273,773	9/06/83
4,402,275	06/298,726	9/06/83
4,402,277	06/321,057	9/06/83
4,402,279	06/341,986	9/06/83
4,402,284	06/238,572	9/06/83
4,402,294	06/343,495	9/06/83
4,402,302	06/275,439	9/06/83
4,402,303	06/343,579	9/06/83
4,402,304	06/303,908	9/06/83
4,402,305	06/236,656	9/06/83
4,402,316	06/257,537	9/06/83
4,402,322	06/247,481	9/06/83
4,402,323	06/262,882	9/06/83
4,402,329	06/306,050	9/06/83
4,402,332	06/218,393	9/06/83
4,402,334	06/330,538	9/06/83
4,402,336	06/261,614	9/06/83
4,402,342	06/312,325	9/06/83
4,402,347	06/254,155	9/06/83
4,402,348	06/252,042	9/06/83
4,402,354	06/406,693	9/06/83
4,402,360	06/324,457	9/06/83
4,402,361	06/293,195	9/06/83
4,402,364	06/331,531	9/06/83
4,402,367	06/273,968	9/06/83
4,402,374	06/304,030	9/06/83
4,402,375	06/222,169	9/06/83
4,402,377	06/298,124	9/06/83
4,402,382	06/262,110	9/06/83
4,402,392	06/294,098	9/06/83
4,402,408	06/380,520	9/06/83
4,402,413	06/322,897	9/06/83
4,402,414	06/219,552	9/06/83
4,402,415	06/312,072	9/06/83
4,402,422	06/320,108	9/06/83
4,402,424	06/327,574	9/06/83
4,402,431	06/226,143	9/06/83
4,402,434	06/338,597	9/06/83
4,402,436	06/282,164	9/06/83
4,402,443	06/253,318	9/06/83
4,402,444	06/255,837	9/06/83
4,402,449	06/392,642	9/06/83
4,402,453	06/277,111	9/06/83
4,402,457	06/288,729	9/06/83
4,402,462	06/270,269	9/06/83
4,402,465	06/269,587	9/06/83

Patent Number	Serial Number	Issue Date
4,402,466	06/264,169	9/06/83
4,402,478	06/239,361	9/06/83
4,402,490	06/361,124	9/06/83
4,402,495	06/311,500	9/06/83
4,402,499	06/349,864	9/06/83
4,402,515	06/359,145	9/06/83
4,402,518	06/313,954	9/06/83
4,402,522	06/241,556	9/06/83
4,402,523	06/237,073	9/06/83
4,402,525	06/276,293	9/06/83
4,402,530	06/295,656	9/06/83
4,402,532	06/218,179	9/06/83
4,402,533	06/258,204	9/06/83
4,402,539	06/230,166	9/06/83
4,402,544	06/337,531	9/06/83
4,402,553	06/250,544	9/06/83
4,402,568	06/232,659	9/06/83
4,402,569	06/267,732	9/06/83
4,402,573	06/274,988	9/06/83
4,402,574	06/255,630	9/06/83
4,402,577	06/233,566	9/06/83
4,402,578	06/281,416	9/06/83
4,402,584	06/351,034	9/06/83
4,402,590	06/282,448	9/06/83
4,402,593	06/336,114	9/06/83
4,402,606	06/238,236	9/06/83
4,402,620	06/333,599	9/06/83
4,402,622	06/249,235	9/06/83
4,402,623	06/330,178	9/06/83
4,402,633	06/235,015	9/06/83
4,402,634	06/270,505	9/06/83
4,402,639	06/242,915	9/06/83
4,402,646	06/230,676	9/06/83
4,402,650	06/282,271	9/06/83
4,402,668	06/240,303	9/06/83
4,402,673	06/302,283	9/06/83
4,402,701	06/304,239	9/06/83
4,402,716	06/336,564	9/06/83
4,402,729	06/376,097	9/06/83
4,402,733	06/255,517	9/06/83
4,402,735	06/380,177	9/06/83
4,402,743	06/263,983	9/06/83
4,402,753	06/288,577	9/06/83
4,402,755	06/414,916	9/06/83
4,402,758	06/348,681	9/06/83
4,402,762	06/269,741	9/06/83
4,402,769	06/448,868	9/06/83
4,402,774	06/323,436	9/06/83
4,402,777	06/287,669	9/06/83
4,402,781	06/363,726	9/06/83
4,402,786	06/298,525	9/06/83
4,402,788	06/372,233	9/06/83
4,402,810	06/263,738	9/06/83
4,402,814	06/339,268	9/06/83
4,402,821	06/321,135	9/06/83
4,402,827	06/284,931	9/06/83
4,402,834	06/250,945	9/06/83
4,402,835	06/319,923	9/06/83
4,402,836	06/445,886	9/06/83
4,402,845	06/267,158	9/06/83
4,402,848	06/385,925	9/06/83
4,402,849	06/218,239	9/06/83
4,402,858	06/368,332	9/06/83
4,402,863	06/320,165	9/06/83
4,402,874	06/456,667	9/06/83
4,402,875	06/303,542	9/06/83
4,402,880	06/316,600	9/06/83
4,402,898	06/306,468	9/06/83
4,402,912	06/333,967	9/06/83
4,402,914	06/282,252	9/06/83
4,402,931	06/383,332	9/06/83
4,402,932	06/376,066	9/06/83
4,402,933	06/257,402	9/06/83
4,402,942	06/238,715	9/06/83
4,402,943	06/337,114	9/06/83
4,402,946	06/337,175	9/06/83
4,402,951	06/252,839	9/06/83
4,402,952	06/313,547	9/06/83
4,402,955	06/307,983	9/06/83
4,402,956	06/234,065	9/06/83
4,402,961	06/271,877	9/06/83
4,402,962	06/393,806	9/06/83
4,402,963	06/327,880	9/06/83
4,402,966	06/252,674	9/06/83
4,402,969	06/340,241	9/06/83
4,402,979	06/315,769	9/06/83
4,402,981	06/243,746	9/06/83
4,402,982	06/337,104	9/06/83
4,402,986	06/286,088	9/06/83
4,402,987	06/300,623	9/06/83
4,402,988	06/361,038	9/06/83
4,402,989	06/297,893	9/06/83
4,402,990	06/296,568	9/06/83
4,402,992	06/328,760	9/06/83
4,402,993	06/245,937	9/06/83
4,402,995	06/343,490	9/06/83
4,403,000	06/312,417	9/06/83
4,403,004	06/314,314	9/06/83
4,403,008	06/356,174	9/06/83
4,403,016	06/417,806	9/06/83
4,403,019	06/362,749	9/06/83
4,403,022	06/221,977	9/06/83
4,403,032	06/342,352	9/06/83
4,403,040	06/350,801	9/06/83
4,403,046	06/308,412	9/06/83
4,403,049	06/327,829	9/06/83
4,403,059	06/349,830	9/06/83
4,403,078	06/414,767	9/06/83
4,403,085	06/330,290	9/06/83
4,403,096	06/278,350	9/06/83
4,403,098	06/357,126	9/06/83
4,403,100	06/316,480	9/06/83
4,403,108	06/249,686	9/06/83
4,403,110	06/263,982	9/06/83
4,403,118	06/245,914	9/06/83
4,403,121	06/289,787	9/06/83
4,403,133	06/326,784	9/06/83
4,403,135	06/252,568	9/06/83
4,403,143	06/226,449	9/06/83
4,403,151	06/250,217	9/06/83
4,403,165	06/375,895	9/06/83
4,403,168	06/295,148	9/06/83
4,403,183	06/252,749	9/06/83
4,403,188	06/247,240	9/06/83
4,403,196	06/256,373	9/06/83
4,403,203	06/323,444	9/06/83
4,403,227	06/309,871	9/06/83
4,403,229	06/316,479	9/06/83
4,403,244	06/231,924	9/06/83
4,403,251	06/274,506	9/06/83
4,403,258	06/315,580	9/06/83
4,403,279	06/317,169	9/06/83
4,403,312	06/221,600	9/06/83
4,403,325	06/240,620	9/06/83
4,403,326	06/276,860	9/06/83
4,403,327	06/256,139	9/06/83
4,403,330	06/281,904	9/06/83
4,403,342	06/251,644	9/06/83
4,403,345	06/302,675	9/06/83
4,403,347	06/232,005	9/06/83
4,403,352	06/326,556	9/06/83
4,691,388	06/853,691	9/08/87
4,691,389	06/926,507	9/08/87
4,691,391	06/872,146	9/08/87
4,691,395	06/941,071	9/08/87
4,691,396	06/941,310	9/08/87
4,691,397	06/871,878	9/08/87
4,691,401	06/838,273	9/08/83
4,691,403	06/847,667	9/08/87
4,691,405	06/759,896	9/08/87
4,691,409	06/941,790	9/08/87
4,691,416	06/912,773	9/08/87
4,691,419	06/797,132	9/08/87
4,691,420	06/846,969	9/08/87
4,691,423	06/824,736	9/08/87
4,691,425	06/562,416	9/08/87

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4,691,432	06/785,705	9/08/87
4,691,441	07/008,278	9/08/87
4,691,443	06/910,084	9/08/87
4,691,446	06/902,655	9/08/87
4,691,450	06/788,275	9/08/87
4,691,453	06/906,262	9/08/87
4,691,454	06/820,405	9/08/87
4,691,457	06/663,718	9/08/87
4,691,459	06/825,148	9/08/87
4,691,460	06/774,027	9/08/87
4,691,461	06/917,919	9/08/87
4,691,462	06/844,134	9/08/87
4,691,463	06/591,120	9/08/87
4,691,466	06/854,923	9/08/87
4,691,468	06/869,338	9/08/87
4,691,470	06/861,825	9/08/87
4,691,471	06/947,621	9/08/87
4,691,472	06/740,842	9/08/87
4,691,473	06/707,884	9/08/87
4,691,477	06/889,762	9/08/87
4,691,478	06/911,513	9/08/87
4,691,480	06/819,281	9/08/87
4,691,481	06/863,365	9/08/87
4,691,484	06/839,600	9/08/87
4,691,491	06/841,285	9/08/87
4,691,504	06/819,157	9/08/87
4,691,505	06/870,723	9/08/87
4,691,512	06/668,018	9/08/87
4,691,515	06/709,509	9/08/87
4,691,517	06/929,507	9/08/87
4,691,518	06/929,508	9/08/87
4,691,543	06/843,673	9/08/87
4,691,552	06/818,475	9/08/87
4,691,553	06/836,837	9/08/87
4,691,556	06/824,666	9/08/87
4,691,563	06/934,922	9/08/87
4,691,566	06/765,839	9/08/87
4,691,575	06/814,401	9/08/87
4,691,576	06/801,685	9/08/87
4,691,580	06/817,077	9/08/87
4,691,582	06/803,954	9/08/87
4,691,585	06/859,088	9/08/87
4,691,586	06/835,893	9/08/87
4,691,587	06/811,733	9/08/87
4,691,599	06/816,066	9/08/87
4,691,610	06/873,800	9/08/87
4,691,611	06/785,764	9/08/87
4,691,623	06/898,960	9/08/87
4,691,624	06/790,405	9/08/87
4,691,626	06/939,627	9/08/87
4,691,627	06/819,751	9/08/87
4,691,644	06/794,439	9/08/87
4,691,658	06/871,480	9/08/87
4,691,660	06/862,037	9/08/87
4,691,664	06/826,316	9/08/87
4,691,668	06/754,729	9/08/87
4,691,672	06/811,916	9/08/87
4,691,685	06/881,637	9/08/87
4,691,688	06/919,086	9/08/87
4,691,689	06/938,479	9/08/87
4,691,690	06/907,721	9/08/87
4,691,692	06/804,828	9/08/87
4,691,698	06/852,819	9/08/87
4,691,700	06/870,140	9/08/87
4,691,709	06/911,375	9/08/87
4,691,712	06/747,017	9/08/87
4,691,719	06/845,849	9/08/87
4,691,720	06/768,468	9/08/87
4,691,721	06/679,259	9/08/87
4,691,724	06/790,614	9/08/87
4,691,726	06/640,687	9/08/87
4,691,732	06/892,037	9/08/87
4,691,733	06/881,778	9/08/87
4,691,741	06/754,283	9/08/87
4,691,743	06/888,225	9/08/87
4,691,764	06/839,357	9/08/87
4,691,770	06/813,927	9/08/87
4,691,773	06/759,359	9/08/87
4,691,777	06/849,125	9/08/87
4,691,778	07/013,078	9/08/87
4,691,782	06/680,190	9/08/87
4,691,795	06/746,786	9/08/87
4,691,798	06/786,078	9/08/87
4,691,800	06/815,100	9/08/87
4,691,803	06/799,350	9/08/87
4,691,804	06/817,295	9/08/87
4,691,821	06/818,530	9/08/87
4,691,824	06/924,990	9/08/87
4,691,827	06/861,337	9/08/87
4,691,837	06/923,016	9/08/87
4,691,839	06/920,929	9/08/87
4,691,842	06/712,924	9/08/87
4,691,848	06/677,352	9/08/87
4,691,860	06/941,229	9/08/87
4,691,863	06/863,687	9/08/87
4,691,864	06/799,868	9/08/87
4,691,873	06/872,210	9/08/87
4,691,890	06/827,304	9/08/87
4,691,895	06/886,735	9/08/87
4,691,904	06/763,670	9/08/87
4,691,917	06/799,554	9/08/87
4,691,919	06/930,644	9/08/87
4,691,920	06/817,549	9/08/87
4,691,922	06/837,794	9/08/87
4,691,923	06/842,229	9/08/87
4,691,928	06/774,655	9/08/87
4,691,945	06/926,050	9/08/87
4,691,953	06/852,191	9/08/87
4,691,963	06/768,448	9/08/87
4,691,964	06/880,591	9/08/87
4,691,965	06/906,447	9/08/87
4,691,967	06/793,224	9/08/87
4,691,976	06/831,007	9/08/87
4,691,979	06/520,151	9/08/87
4,691,987	06/512,403	9/08/87
4,691,991	06/624,701	9/08/87
4,692,003	06/549,157	9/08/87
4,692,004	06/918,706	9/08/87
4,692,006	06/834,429	9/08/87
4,692,016	06/839,911	9/08/87
4,692,046	06/843,913	9/08/87
4,692,051	06/446,884	9/08/87
4,692,053	06/912,523	9/08/87
4,692,059	06/826,619	9/08/87
4,692,060	06/882,081	9/08/87
4,692,079	06/650,703	9/08/87
4,692,084	06/802,052	9/08/87
4,692,085	06/790,131	9/08/87
4,692,087	06/549,268	9/08/87
4,692,094	06/825,069	9/08/87
4,692,095	06/816,127	9/08/87
4,692,097	06/878,304	9/08/87
4,692,100	06/706,266	9/08/87
4,692,101	06/754,419	9/08/87
4,692,112	06/904,863	9/08/87
4,692,113	06/906,120	9/08/87
4,692,118	06/823,456	9/08/87
4,692,120	06/914,452	9/08/87
4,692,126	06/728,320	9/08/87
4,692,128	06/878,547	9/08/87
4,692,132	06/829,938	9/08/87
4,692,134	06/870,881	9/08/87
4,692,137	06/719,179	9/08/87
4,692,151	06/835,942	9/08/87
4,692,155	06/808,280	9/08/87
4,692,158	06/825,506	9/08/87
4,692,164	06/837,094	9/08/87
4,692,170	06/556,137	9/08/87
4,692,173	06/829,481	9/08/87
4,692,174	06/547,752	9/08/87
4,692,198	06/694,828	9/08/87
4,692,202	06/434,722	9/08/87
4,692,203	06/899,941	9/08/87
4,692,208	06/654,834	9/08/87
4,692,210	06/789,783	9/08/87
4,692,218	06/471,785	9/08/87

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4,692,244	06/671,599	9/08/87
4,692,246	06/853,053	9/08/87
4,692,249	06/910,477	9/08/87
4,692,260	06/757,039	9/08/87
4,692,262	06/908,697	9/08/87
4,692,265	06/623,336	9/08/87
4,692,273	06/723,391	9/08/87
4,692,276	06/783,688	9/08/87
4,692,285	06/750,443	9/08/87
4,692,308	06/827,151	9/08/87
4,692,313	06/597,314	9/08/87
4,692,320	06/813,169	9/08/87
4,692,321	06/887,752	9/08/87
4,692,323	06/878,976	9/08/87
4,692,333	06/520,088	9/08/87
4,692,338	06/716,609	9/08/87
4,692,345	06/868,153	9/08/87
4,692,353	06/567,782	9/08/87
4,692,356	06/703,679	9/08/87
4,692,363	06/889,581	9/08/87
4,692,365	06/666,522	9/08/87
4,692,367	06/856,064	9/08/87
4,692,372	06/878,250	9/08/87
4,692,376	06/936,128	9/08/87
4,692,384	06/923,986	9/08/87
4,692,431	06/809,441	9/08/87
4,692,436	06/861,471	9/08/87
4,692,438	06/764,372	9/08/87
4,692,450	06/817,638	9/08/87
4,692,452	06/873,616	9/08/87
4,692,453	06/797,563	9/08/87
4,692,456	06/838,972	9/08/87
4,692,461	06/933,492	9/08/87
4,692,465	06/640,850	9/08/87
4,692,474	06/874,329	9/08/87
4,692,482	06/921,463	9/08/87
4,692,491	06/907,563	9/08/87
4,692,493	06/847,640	9/08/87
4,692,495	06/512,768	9/08/87
4,692,509	06/675,373	9/08/87
4,692,515	06/874,917	9/08/87
4,692,523	06/916,373	9/08/87
4,692,526	06/797,111	9/08/87
4,692,532	06/674,217	9/08/87
4,692,536	06/917,948	9/08/87
4,692,537	06/810,307	9/08/87
4,692,542	06/622,571	9/08/87
4,692,543	06/832,760	9/08/87
4,692,544	06/768,709	9/08/87
4,692,558	06/493,700	9/08/87
4,692,567	06/733,874	9/08/87
4,692,571	06/902,909	9/08/87
4,692,584	06/802,984	9/08/87
4,692,586	06/871,361	9/08/87
4,692,588	06/720,403	9/08/87
4,692,593	06/694,780	9/08/87
4,692,594	06/793,207	9/08/87
4,692,614	06/855,184	9/08/87
4,692,622	06/803,967	9/08/87
4,692,623	06/835,826	9/08/87
4,692,625	06/747,731	9/08/87
4,692,632	06/832,925	9/08/87
4,692,647	06/367,680	9/08/87
4,692,661	06/830,152	9/08/87
4,692,668	06/516,598	9/08/87
4,692,669	06/705,740	9/08/87
4,692,671	06/893,946	9/08/87
4,692,678	06/916,993	9/08/87
5,692,682	06/812,633	9/08/87
4,692,684	06/908,219	9/08/87
4,692,692	06/784,119	9/08/87
4,692,693	06/694,439	9/08/87
4,692,703	06/704,253	9/08/87
4,692,706	06/706,376	9/08/87
4,692,720	06/717,116	9/08/87
4,692,722	06/660,491	9/08/87
4,692,726	06/890,686	9/08/87
4,692,742	06/789,568	9/08/87
4,692,744	06/815,586	9/08/87
4,692,751	06/902,771	9/08/87
4,692,764	06/876,979	9/08/83
4,692,771	06/717,498	9/08/87
4,692,772	06/650,069	9/08/87
4,692,775	06/792,329	9/08/87
4,692,802	06/812,146	9/08/87
4,692,820	06/881,621	9/08/87
4,692,821	06/815,371	9/08/87
4,692,826	06/851,799	9/08/87
4,692,830	06/623,147	9/08/87
4,692,838	06/882,398	9/08/87
4,692,847	06/769,825	9/08/87
4,692,850	06/814,329	9/08/87
4,692,851	06/708,011	9/08/87
4,692,868	06/692,465	9/08/87
4,692,882	06/689,549	9/08/87
4,692,889	06/655,657	9/08/87
4,692,906	06/808,704	9/08/87
4,692,926	06/727,251	9/08/87
4,692,940	06/711,821	9/08/87
4,692,945	06/933,367	9/08/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,371,421	06/254,871	2/01/83	4/16/81	10/09/91
4,375,316	06/237,592	3/01/83	2/24/81	10/09/91
4,610,728	06/681,609	9/09/86	12/14/84	10/09/91
4,621,176	06/788,514	11/04/86	10/18/85	9/24/91
4,629,191	06/751,956	12/16/86	7/05/85	10/09/91
4,674,365	06/517,673	6/23/87	7/27/83	10/09/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,791,085, Re. S.N. 07/745,542, Filed Aug. 15, 1991, Cl. 502/068, BARIUM TITANIUM OXIDE-CONTAINING FLUIDIZABLE CRACKING CATALYST COMPOSITION, Cornelis J. Groenenboom, Owner of Record: *Akzo N.V., Arnhem, Netherlands*, Attorney or Agent: William P. Berridge, Ex. Gp.: 113

4,804,003, Re. S.N. 07/774,578, Filed Oct. 10, 1991, Cl. 132/53, COMBINED HEAD COVERING WIGLET, Leanna L. Moen, Owner of Record: *Inventor*, Attorney or Agent: H. Vincent Harsha, Ex. Gp.: 333

4,810,358, Re. S.N. 07/745,541, Filed Aug. 15, 1991, Cl. 208/121, PROCESS FOR CRACKING METAL-CONTAINING HYDROCARBON FEEDSTOCKS, Cornelis J. Groenenboom, Owner of Record: *Akzo N.V., Arnhem, Netherlands*, Attorney or Agent: William P. Berridge, Ex. Gp.: 119

4,867,119, Re. S.N. 07/762,203, Filed Sept. 19, 1991, Cl. 123/193P, ENGINE PISTON ASSEMBLY AND FORGED PISTON MEMBER THEREFOR HAVING A COOKING RECESS, Bruce C. Cooper, et. al., Owner of Record: *Caterpilar Inc., Peoria, Ill.*, Attorney or Agent: Edward J. Kessler, Ex. Gp.: 342

4,873,101, Re. S.N. 07/774,468, Filed Oct. 10, 1991, Cl. 426/113, MICROWAVE FOOD PACKAGE AND GREASE ABSORBENT PAD THEREFOR, Curtis L. Larson, et. al., Owner of Record: *Minnesota Mining & Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Mark W. Binder, Ex. Gp.: 132

4,874,357, Re. S.N. 07/776,083, Filed Oct. 11, 1991, Cl. 494/26, CENTRIFUGAL FLOTATION APPARATUS AND METHOD, Thomas P. Campbell, Owner of Record: *Inventor*, Attorney or Agent: Richard J. St. John, Ex. Gp.: 242

4,874,617, Re. S.N. 07/777,195, Filed Oct. 16, 1991, Cl. 426/49, BANANA PROCESSING, Pedro Sole, Owner of Record: *Chiquita Brands, Inc., Cincinnati, Ohio*, Attorney or Agent: Timothy A. French, Ex. Gp.: 132

4,883,527, Re. S.N. 07/775,418, Filed Oct. 15, 1991, Cl. 65/273, GLASS SHEET BENDING AND TEMPERING APPARATUS, Harold A. McMaster, et. al., Owner of Record: *Glasstech International L.P., Scarsdale, N.Y.*, Attorney or Agent: Christopher J. Fildes, Ex. Gp.: 133

4,998,817, Re. S.N. 07/766,830, Filed Sept. 27, 1991, Cl. 351/162, CONTACT LENS FOR CORRECTION OF COLOR BLINDNESS, Harry I. Zelter, Owner of Record: *Joseph Zallen, Fort Lauderdale, Fla.*, Attorney or Agent: Joseph Zallen, Ex. Gp.: 257

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,940,221, Reexam No. 90/002,483, Requested Oct. 21, 1991, Cl. 425/141, THICKNESS CONTROL SYSTEM FOR AN EXTRUSION DIE, Frank R. Nissel, Owner of Record: *W Bar E, Inc., Marianna, Fla.*, Attorney or Agent: Austin R. Miller, Philadelphia, Pa. Ex. Gp.: 135, Requester: The Clorer Co., Orange, Tex.

4,388,288, Reexam No. 90/002,495, Requested Oct. 25, 1991, Cl. 423/416, PREPARATION OF SHAPED TITANIUM DIOXIDE CATALYST/CARRIER AND CATALYSIS OF GASEOUS SULFUR COMPOUNDS THEREWITH, Thierry Dupin, et. al., Owner of Record: *Rhone-Poulenc Industries, Paris, France*, Attorney or Agent: Norman H. Stepno, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 113, Requester: La Roche Chemicals, Inc., Baton Rouge, La.

4,475,319, Reexam No. 90/002,491, Requested Oct. 22, 1991, Cl. 428/290.000, THERMOPLASTIC INTERLEAFED RESIN MATRIX COMPOSITES WITH IMPROVED IMPACT STRENGTH AND TOUGHNESS, Robert E. Evans, et. al., Owner of Record: *American Cyanamid Co., Stanford, Conn., Attorney or Agent: Steven J. Hultquist, American Cyanamid Co., Stamford, Conn.* Ex. Gp.: 154, Requester: Toray Industries, Inc., Tokyo, Japan

4,615,385, Reexam No. 90/002,479, Requested Oct. 15, 1991, Cl. 165/175, HEAT EXCHANGER, Zalman P. Saperstein, et. al., Owner of Record: *Modine Manufacturing Co., Racine, Wis.*, Attorney or Agent: William Vansanten, Wood, Phillips, Mason, Recktenwald & Vansanten, Chicago, Ill., Ex. Gp.: 347, Requester: Jordan M. Meschkow, Phoenix, Ariz.

4,628,180, Reexam No. 90/002,482, Requested Oct. 16, 1991, Cl. 219/124.010, WELDING SYSTEM FOR TIG WELDING, Heini Edberg, Owner of Record: *Heini Edberg, Hunseby, Denmark*, Attorney or Agent: Merchant, Gould, Smith, Edell, Welter & Schmidt, Minneapolis, Minn., Ex. Gp.: 216, Requester: Nils H. Ljungman, Greensburg, Pa.

4,637,802, Reexam No. 90/002,488, Requested Oct. 21, 1991, Cl. 440/075.00, TWIN OUTBOARD DRIVE FOR WATERCRAFT, Michihiro Taguchi, et. al., Owner of Record: *Sanshin Kogyo Kabushiki Kaisha, Hamamatsu-Shi, Japan*, Attorney or Agent: Ernest A. Beutler, Newport Beach, Calif., Ex. Gp.: 315, Requester: Michael Best & Friedrich, Milwaukee, Wis.

4,711,251, Reexam No. 90/002,494, Requested Sept. 10, 1991, Cl. 128/784, BODY IMPLANTABLE LEAD, Kenneth B. Stokes, Owner of Record: *Medtronic, Inc., Minneapolis, Minn.*, Attorney or Agent: Oliver F. Arrett, Vidas & Arrett, Minneapolis, Minn., Ex. Gp.: 335, Requester: Jeffrey G. Sheldon, Pasadena, Calif.

4,733,665, Reexam No. 90/002,493, Requested Oct. 23, 1991, Cl. 606/108, EXPANDABLE INTRALUMINAL GRAFT, AND METHOD AND APPARATUS FOR IMPLANTING AND EXPANDABLE INTRALUMINAL GRAFT, Julio C. Palmaz, Owner of Record: *Expandable Grafts Partnership, Antonio, Tex.*, Attorney or Agent: Ben D. Tobor, Houston, Tex., Ex. Gp.: 339, Requester: Owner

4,748,962, Reexam No. 90/002,480, Requested Oct. 17, 1991, Cl. 124/025.6, COMPOUND ARCHERY BOWS, Marlow W. Larson, Owner of Record: *Browning Arms Co., Morgan, Utah.*, Attorney or Agent: David V. Trask, Trask, Britt & Rossa, Salt Lake City, Utah, Ex. Gp.: 351, Requester: Proline Co., Hastings, Mich.

4,889,726, Reexam No.: 90/002,486, Requested: Oct. 21, 1991, Cl. 426/003.000, USING COCOA POWDER TO ENHANCE THE FLAVOR OF A MINT-FLAVORED CHEWING GUM, Jayant C. Dave, et. al., Owner of Record: *Willaim Wrigley Jr. Co., Chicago, Ill.*, Attorney or Agent: Maxwell J. Peterson, Willian, Brinks, Olds, Hofer, Gilson & Lione, Chicago, Ill., Ex. Gp.: 132, Requester: Owner

4,889,727, Reexam No. 90/002,487, Requested Oct. 21, 1991, Cl. 426/003.000, USING COCOA POWDER TO ENHANCE THE FLAVOR OF SYNTHETIC CHEWING BASE, Jayant C. Dave, et. al., Owner of Record: *William Wrigley Jr. Co., Chicago, Ill.*, Attorney or Agent: Maxwell J. Peterson, Willian, Brinks, Olds, Hofer, Gilson & Lione, Chicago, Ill., Ex. Gp.: 132, Requester: Owner

4,942,928, Reexam No. 90/002,485, Requested Oct. 16, 1991, Cl. 172/219, BIDIRECTIONAL MOLDBOARD PLOW WITH ADJUSTABLE TILTING MECHANISM, Pompeyo B. Gomez, Owner of Record: *Industrias John Deere, Nueno Leon, Mexico*, Attorney or Agent: Oblon, Fisher, Spivak, McClelland & Maier, Arlington, Va., Ex. Gp.: 351, Requester: Harrell Equipment Co., Inc., Pelham, Ga.

4,985,404, Reexam No. 90/002,490, Requested Oct. 22, 1991, Cl. 514/006.000, PROLONGED RELEASE OF BIOLOGICALLY ACTIVE POLYPEPTIDES, James W. Mitchell, Owner of Record: *Monsanto Co., St. Louis, Mo.*, Attorney or Agent: Wayne R. Eberhardt, St. Louis, Mo. Ex. Gp.: 188, Requester: Owner

5,008,725, Reexam No. 90/002,478, Requested Oct. 9, 1991, Cl. 357/023.4, PLURAL POLYGON SOURCE PATTERN FOR MOSFET, Alexander Lidow, et. al., Owner of Record: Alexander Lidow, Manhattan Beach, Calif., Thomas Herman, Redondo Beach, Calif., Vladimir Rumennik, El Segundo, Calif., Attorney or Agent: Samuel H. Weiner, Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 258, Requester: Harris Corp., Melbourne, Fla.

5,009,654, Reexam No. 90/002,489, Requested Oct. 18, 1991, Cl. 604/410, STERILE PRODUCT AND METHOD FOR STERILIZING AND ASSEMBLING SUCH PRODUCT, Billy W. Minshall, Owner of Record: *Baxter International, Inc., Deerfield, Ill.*, Attorney or Agent: Bradford R. L. Price, Deerfield, Ill. Ex. Gp.: 331, Requester: Owner

5,020,507, Reexam No. 90/002,477, Requested Oct. 15, 1991, Cl. 124/025.6, COMPOUND ARCHERY BOW, Marlow W. Larson, Owner of Record: Browning Arms Co., Morgan, Utah, Attorney or Agent: David V. Trask, Trask, Britt & Rossa, Salt Lake City, Utah, Ex. Gp.: 351, Requester: Proline Co., Hastings, Mich.

5,028,667, Reexam No. 90/002,484, Requested Oct. 21, 1991, Cl. 525/415, YTTRIUM ANF RARE EARTH COMPOUNDS CATALYZED LACTONE POLYMERIZATION, Stephen J. McLain, et. al., Owner of Record: *E. I. du Pont de Nemours & Co., Wilmington, Del.*, Attorney or Agent: Barbara C. Siegell, Wilmington, Del., Ex. Gp.: 153, Requester: Owner

5,030,502, Reexam No. 90/002,492, Requested Oct. 21, 1991, Cl. 428/193, CEMENTITIOUS CONSTRUCTION PANEL, John W. Teare, Owner of Record: *Inventor, Hamilton, Ohio*, Attorney or Agent: none, Ex. Gp.: 158, Requester: Owner

5,037,384, Reexam No. 90/002,481, Requested Oct. 17, 1991, Cl. 604/028, METHOD AND APPARATUS FOR THE TREATMENT OF COMPLICATED RETINAL DETACHMENTS, Stanley Chang, Owner of Record: *Cornell Research Foundation, Inc., Ithaca, N.Y.*, Attorney or Agent: George M. Yahwak, Yahwak & Associates, Trumbull, Conn., Ex. Gp.: 333, Requester: David J. Josephic, Wood, Herron & Evans, Cincinnati, Ohio

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Interference Practice: Consideration of Fraud and Inequitable Conduct

The Commissioner's Notice of Oct. 24, 1991, *Consideration of Fraud and Inequitable Conduct in Patent Interference Cases*, provides that:

> Effective immediately, fraud and inequitable conduct issues will be considered when properly raised *inter partes* in patent interference cases.

* * * * *

> The Chairman, the Vice Chairman, an Examiner-in-Chief or a panel of the Board of Patent Appeals and Interferences, as may be appropriate, are authorized to determine the manner in which fraud and inequitable conduct can be raised in any interference pending before the Board at this time.

The present notice sets forth the policy which will be applied by the Board of Patent Appeals and Interferences (Board) in determining whether the issues of fraud and inequitable conduct raised in a pending interference proceeding will be given consideration.

1. Issues of fraud and inequitable conduct which were raised in an interference for the first time before the date of the Commissioner's Notice (Oct. 24, 1991) will not be considered by the Board.

2. Issues of fraud and inequitable conduct raised in an interference for the first time after the date of the Commissioner's Notice will be considered by the Board if:

(a) They are raised by way of a motion for judgment under 37 CFR 1.633(a) which was filed before the expiration of the period set for filing preliminary motions, or

(b) They are raised subsequent to the period set for filing preliminary motions, and the party raising them shows good cause under 37 CFR 1.655(b)(3) as to why they were not timely raised during the preliminary motion period. An assertion that the issues were not raised earlier because the Board was precluded from considering them by the Commissioner's Notice of October 17, 1988 (1096 Off. Gaz. PTO 19, Nov. 8, 1988) shall not be deemed good cause. Examples of good cause would be (i) where the fraud or inequitable conduct was not discovered until after the close of the period for filing preliminary motions, or (ii) where the period for filing preliminary motions expired after the Oct. 24, 1991, date of the Commissioner's Notice but before publication of the notice in the *Official Gazette*, and the preliminary motion for judgment raising the issue of fraud and inequitable conduct was filed promptly after the notice was published.

Counsel who are contemplating raising issues of fraud and inequitable conduct should direct their attention to the Commissioner's Notice of Dec. 23, 1986, *Interference Practice: Fraud and Inequitable Conduct Allegations* (1074 Off. Gaz. Pat. Office, Jan. 27, 1987).

Oct. 30, 1991

SAUL I. SEROTA
Chairman, Board of Patent Appeals and Interferences

Telephone Changes for Deposit Account Status Line

Effective Nov. 18, 1991, new telephone exchange numbers will be made for the Deposit Account Status Line. On that date, Deposit Account Balance information can be obtained by calling **(703) 305-8735 or (703) 305-8746** from **6:30 a.m. until midnight**, Eastern time, Monday thru Friday, except for Federal holidays.

Questions that may arise pertaining to the information received through use of the status line may be referred to the Deposit Account Division at **(703) 308-0902**. Calls will be received on the answering machine 24 hours a day, seven days a week.

Oct. 31, 1991

BRADFORD HUTHER
Assistant Commissioner for Finance and Planning

Status of PTO Services

The following is an update of the status of PTO services for Oct. 1991:

Service Item	FY 1991 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	17
Trademarks	30	28
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	2
Mail Coupons	12	7
Letter Orders	16	20
Electronic Ordering Service (EOS)	11	5
Certified Copies:		
Trademark Registrations	21	14
Applications-As-Filed	17	16
File-Wrapper/Contents	N/A	19
Walk-up Certification	1	1
Patent Application Expedited	5	6
Trademark Search Library:		
Filing Pending Marks	23	32
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	11
Assignments:		
Recording Patent-New Applications	20**	13
Recording Patent-Mail Room Recpts.	20	8
Return Patents-New Applications	34**	36
Return Patents-Mail Room Recpts.	34	32
Recording Trademarks	20	10
Returning Trademark Documents	34	30
Avg. Days from Issue Fee Payment to Issue Date	90-100	106
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	91% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.
**Goal reflects the number of days from the date the filing receipt is mailed.

•*Helpful Hints*

Change of Correspondence Address

The Patent and Trademark Office's responsibility is to assure office correspondence reaches the correspondent's address of record. Recent studies conducted of mail returned to the PTO from the United States Postal Service (USPS) as undeliverable indicates that the majority of this mail is not delivered due to the expiration of a forwarding order placed with the UPPS.

Whenever the correspondence address for a patent, patent application, registered trademark or trademark application changes, the applicant or his/her representative needs to submit a change of address (See Section 601.03 of the Manual of Patent Examining Procedures and Section 603 of the Trademark Manual of Examining Procedures). The mere inclusion of a new correspondence address in a paper being filed for another purpose would not ordinarily be recognized or deemed as instructions to change the address on the file record.

Although a change of correspondence address notification need take no particular form, a separate notification must be filed for each application. At a minimum, the following information should be provided:

- •Identify the documents as a "Change of Address"
- •Prepare the new correspondence address
- •For a patent: State the patent number and serial number
- •For a registered trademark: Provide the registrant's name and the number and date of the certificate.
- •For a trademark application: Provide the name of the applicant, the serial number and filing date of the application, along with the Trademark law office in which the case is pending. See Trademark Rule 1.5.
- •For a national patent application: Identify the application number (consisting of the series code and the serial number (e.g., 07/123,456)); or the serial number and filing date assigned to that application by the PTO. In addition, provide the group art unit where the application is pending or other unit prosecuting the application (e.g., the Board of Patent Appeals and Interferences).
- •For an international application: Identify the international application number (e.g., PCT/US91/11111)

For patents and patent applications, as required by 37 CFR 1.33(a), a change of correspondence address notification must be signed by an attorney or agent of record or by the applicant unless the assignee of record has intervened as provided by 37 CFR 1.32. In those instances where a change of address of a registered attorney or agent is necessary, provisions exist for changing a large number of applications and are contained in Section 601.03 of the Manual of Patent Examining Procedure.

November 1, 1991

THERESA A. BRELSFORD
Assistant Commissioner for
Public Services and Administration

PATENT NOTICES

Certificates of Correction For Week of November 26, 1991

D. 303,442	4,861,352	4,920,138	4,947,042
PP. 7,281	4,862,316	4,920,357	4,947,827
Re. 33,092	4,863,857	4,920,793	4,949,221
4,596,935	4,864,029	4,921,828	4,949,282
4,617,334	4,872,428	4,923,057	4,949,306
4,639,859	4,873,053	4,926,180	4,949,425
4,646,245	4,873,182	4,927,704	4,950,278
4,649,548	4,876,295	4,930,879	4,950,287
4,723,984	4,877,694	4,930,982	4,950,354
4,753,850	4,880,791	4,931,533	4,950,391
4,773,742	4,885,145	4,932,072	4,950,980
4,780,447	4,889,577	4,932,766	4,950,995
4,784,543	4,891,267	4,932,951	4,951,655
4,796,637	4,891,690	4,933,041	4,951,671
4,797,253	4,892,407	4,933,092	4,951,838
4,800,026	4,893,651	4,933,543	4,952,116
4,813,197	4,897,038	4,933,768	4,952,873
4,818,440	4,900,704	4,933,909	4,953,642
4,820,689	4,901,511	4,933,976	4,954,629
4,824,779	4,904,478	4,934,649	4,954,843
4,828,216	4,906,507	4,934,994	4,956,651
4,829,102	4,907,076	4,935,083	4,956,702
4,830,500	4,907,286	4,938,288	4,957,113
4,830,808	4,909,851	4,939,178	4,957,785
4,830,852	4,910,625	4,939,279	4,957,797
4,832,832	4,911,020	4,939,954	4,958,034
4,833,519	4,911,992	4,939,988	4,958,169
4,839,690	4,913,471	4,940,188	4,974,968
4,840,139	4,913,785	4,940,999	4,979,191
4,845,528	4,914,052	4,941,624	5,007,714
4,848,879	4,914,235	4,942,053	5,008,898
4,850,102	4,915,802	4,942,634	5,014,229
4,850,970	4,916,224	4,942,830	5,016,747
4,852,992	4,916,895	4,942,899	5,017,527
4,855,433	4,917,510	4,942,917	5,019,648
4,855,927	4,918,420	4,943,873	5,032,087
4,856,348	4,918,534	4,944,986	5,033,563
4,858,148	4,918,780	4,945,390	5,035,291
4,860,230	4,920,035	4,946,780	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of personel for NFC
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents except: trademark registrations and assignments.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Invoices directed to the Office of Finance.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box ITU	All intent to use documents, excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Purdue University Libraries	(317) 494-2873
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Misssissippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138

Reference Collections of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	7/29/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	3/29/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — BARRY S. RICHMAN, Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/6/90
BIOTECHNOLOGY, GROUP 180 — EDWARD E. KUBASIEWICZ, Director	308-0196	6/2/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	4/17/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	3/24/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	8/15/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 240 — CARLTON CROYLE, Director	308-0771	9/15/90
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	12/1/90
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	6/22/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	2/20/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	1/22/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	1/29/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	10/1/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	12/7/90
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	10/1/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during October 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

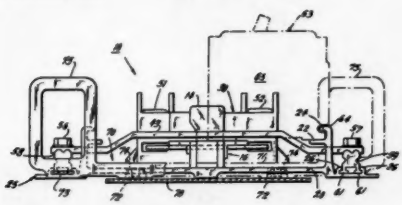
Patents ..... Numbers 3,838,466 to 3,845,503 inclusive
Plant Patents ..... 3,628 to 3,643

REEXAMINATIONS

NOVEMBER 26, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,167,769 (1592nd)
PANELBOARD HAVING DISTRIBUTED NEUTRAL
Roger D. Luke, Norcross, and John M. Rhodes, Atlanta, both of Ga., assignors to Siemens-Allis, Inc.
Reexamination Request Nos. 90/002,069, Jun. 25, 1990 and 90/002,132, Sep. 10, 1990.
Reexamination Certificate for Patent No. 4,167,769, issued Sep. 11, 1979, Ser. No. 920,154, Jun. 29, 1978.
Int. Cl.[5] H02B *1/04*
U.S. Cl. 361—355



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **3** are determined to be patentable as amended.

Claims **2** and **4–6**, dependent on an amended claim, are determined to be patentable.

1. An electrical power distribution device including a base, first and second parallel elongated neutral bars mounted to said base, first and second elongated mounting formations on said base for supporting load ends of circuit breakers when the latter are mounted to said device, said first and second mounting formations being in the vicinity of the respective first and second neutral bars and being positioned inboard thereof, [a line contact array] *first and second main busses having a plurality of circuit breaker engageable stab portions* disposed between said *first and second* mounting formations, *said stab* portions to be electrically engaged with circuit breakers when the latter are mounted to said device, an electrical conductor disposed at one end of said array and having its opposite ends secured to said first and second neutral bars to provide an electrical connection therebetween.

B1 4,336,554 (1593rd)

Patent Not Issued For This Number

B2 4,569,444 (1594th)
EGG PROCESSING SYSTEM
John C. McEvoy, Canton; George N. Bliss, Franklin, and Leslie P. Thomas, Canton, all of Mich., assignors to Diamond Automations, Inc.
Reexamination Request No. 90/001/573, Aug. 5. 1988 and 90/001,948, Feb. 25, 1990
Reexamination Certificate for Patent No. 4,569,444, issued Feb. 11, 1986, Ser. No. 394,162, Jul. 1, 1982.
Reexamination Certificate B1 4,569,444, issued Aug. 9, 1988.
Int. Cl.[5] A01K *43/08*; B65G *47/46*
U.S. Cl. 209—510

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **54** and **55** is confirmed.

Claims **2** and **24** are cancelled.

Claims **1**, **10**, **14**, **25**, **29–33**, **40**, **44**, **48**, **53** and **56** are determined to be patentable as amended.

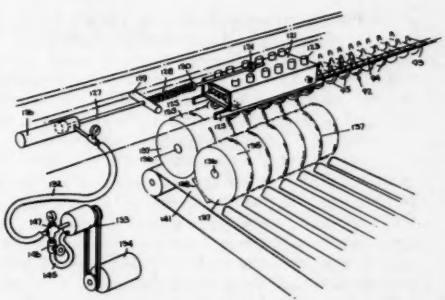
Claims **3–9**, **11–13**, **15–23**, **26–28**, **34–39**, **41–43**, **45–47** and **49–52**, dependent on an amended claim, are determined to be patentable.

New claims **57–76** are added and determined to be patentable.

1. An apparatus for transferring eggs continuously conveyed by a first conveyor means to a receiving station of an egg grading apparatus at which the eggs are packaged according to their physical characteristics, comprising:

means for determining a physical characteristic of each of the eggs and storing the measured characteristics;

means disposed *above and* adjacent to said first conveyor means at said receiving station, for *selectively* releasing eggs having the same physical characteristics from said first conveyor means *according to a drop trajectory determined by the conveyor speed* in a predetermined sequence *determined by the stored physical characteristics of the eggs,*



into a receiving means at said receiving station, said releasing means being movable *along the direction of conveyance of the eggs* with respect to said receiving station,

said first conveyor means including a plurality of releasable egg-engaging means for continuously conveying and delivering a plurality of eggs in spaced-apart, aligned relationship to said receiving station, and

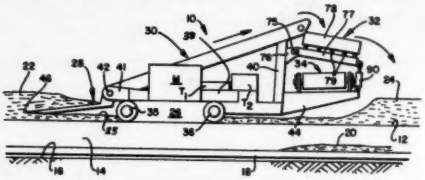
means operatively communicative with drive means for said first conveyor means and responsive to said drive means and coupled to said releasing means, for varying the position of said releasing means with respect to said receiving station according to the speed of said first conveyor means, said means for varying being responsive to variations in the speed of said first conveyor means thereby to adjust the position of said releasing means to compensate for said variations in the speed of said first conveyor means, *said releasing means comprising means movable into the path of said releasable egg-engaging means of said first conveyor means for selectively actuating said releasable egg-engaging means in said predetermined sequence responsive to the stored physical characteristics so as selectively to release the eggs carried by said egg-engaging means into the receiving means.*

B1 4,633,602 (1595th)

METHOD AND APPARATUS FOR PADDING PIPE

Ricky L. Layh, and Christy B. Landrum, Jr., both of Hobbs, N. Mex., assignors to CRC-Evans Pipeline International, Inc., Tex.

Reexamination Request No. 90/002,311, Apr. 1, 1991.
Reexamination Certificate for Patent No. 4,633,602, issued Jan. 6, 1987, Ser. No. 771,840, Sep. 3, 1985.
Int. Cl.[5] E02F *5/12*
U.S. Cl. 37—195



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **3** is confirmed.

Claims **1** and **4** are determined to be patentable as amended.

Claims **2** and **5**, dependent on an amended claim, are determined to be patentable.

New claims **6–30** and **31** are added and determined to be patentable.

1. Apparatus for continuously moving along the ground parallel to the *pipeline* ditch while continuously gathering and processing excavated material which lies on the ground adjacent to **[**a**]** *the* pipeline ditch so as to enable padding material to be separated from the gathered material and conveyed back into the ditch, with the residue from the processed material being returned to the ground adjacent to the ditch;

said apparatus having a longitudinal conveyor arranged parallel to the path of travel of the apparatus, and means forming a gathering head at the forward marginal end of the conveyor for gathering excavated material from the ground and forcing the excavated material onto the leading end of the conveyor; said conveyor having a forward end opposed to a discharge end and translocates the gathered material rearwardly to an elevated position;

means by which said gathering head is pivotally mounted to said apparatus and forms the forward marginal end thereof; said gathering head has a ground engaging lip at the forward end thereof, said gathering head can be pivotally moved vertically respective to the excavated material in order to gather a controlled amount of excavated material for subsequently processing into *the* padding material;

a separator means supported at the rear end of the apparatus for separating padding material and residual processed material from the translocated gathered material; said separator means being located in underlying relationship respective to the discharge end of the longitudinal conveyor;

a lateral conveyor means positioned in underlying relationship respective to the separator means for translocating the padding material received from the separator into the ditch and thereby covering a pipe which may be located in the ditch;

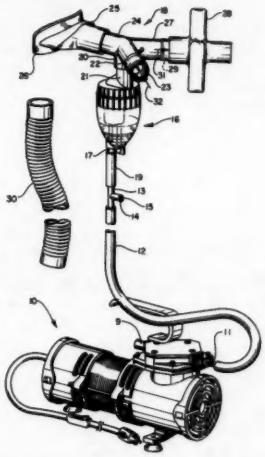
and means for redepositing the residual processed material from the separator onto the remaining said material which lies on the ground along a path which is parallel to the ditch.

B1 4,823,784 (1596th)

AEROSOL INHALATION APPARATUS

Maurice E. Bordoni, Westtown, and Ephraim Lieberman, Suffern, both of N.Y., assignors to Cadema Medical Products, Inc., Middletown, N.Y.

Reexamination Request No. 90/002,147, Sep. 25, 1990.
Reexamination Certificate for Patent No. 4,823,784, issued Apr. 25, 1989, Ser. No. 115,903, Nov. 2, 1987.
Int. Cl.[5] A61M *11/00*; **B05B** *17/06*; **A62B** *7/00*
U.S. Cl. 128—200.14



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **10–19** and **25** is confirmed.

Claims **1**, **5**, **6**, **9** and **20–24** are determined to be patentable as amended.

Claims **2–4**, **7** and **8**, dependent on an amended claim, are determined to be patentable.

1. An aerosol inhalation apparatus for supplying an aerosol mist to a subject comprising:

a disposable aerosol inhalation device, the device including a nebulizer having a compressed air inlet and an outlet for an aerosol mist generated therein, a first conduit in fluid communication with said outlet of said nebulizer, a second conduit having a first one-way valve therein for providing one-way fluid communication from ambient to an intersection between said first conduit and said second conduit, a third conduit providing fluid communication from the intersection between said first conduit and said second conduit, a filter coupled to said third conduit, a second one-way valve positioned in said third conduit for providing one-way fluid communication from the intersection to ambient via said filter and fourth conduit providing fluid communication between an airway of a patient and the intersection;

a source of compressed air; and

means coupling said source of compressed air to said compressed air inlet of said nebulizer for delivering compressed air thereto;

whereby said one-way fluid communication from ambient to the intersection between said first conudit and said second conduit eases said patient's breathing by allowing inhalation independent of said source of compressed air.

B1 4,970,243 (1597th)

PROCESS FOR THE PRODUCTION OF FLEXIBLE SLABSTOCK POLYURETHANE FOAMS

Gundolf Jacobs, Bergisch Gladbach; Peter Haas, Haan; Hans-Walter Illger, Roesrath-Forsbach; Hans-Joachim Kogelnik, Bergisch Gladbach, and Klaus-Dieter Wolf, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Reexamination Request No. 90/002,279, Feb. 8, 1991.
Reexamination Certificate for Patent No. 4,970,243, issued Nov. 13, 1990, Ser. No. 361,896, Jun. 6, 1989.
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819940
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—155

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

1. A process for the production of an elastic, open-cell flexible slabstock polyurethane foam comprising reacting at an isocyanate index less than about 80,

(a) one or more polyisocyanates selected from the group consisting of tolylene diisocyanates, hexamethylene diisocyanate, and isophorone diisocyanate, with

(b) a compound containing at least two isocyanate-reactive hydrogen atoms and having a molecular weight of about 400 to about 10,000, in the presence of

(c) water as blowing agent in a quantity of about 5 to about 15 parts by weight for every 100 parts by weight of component (b).

REISSUES

NOVEMBER 26, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,750

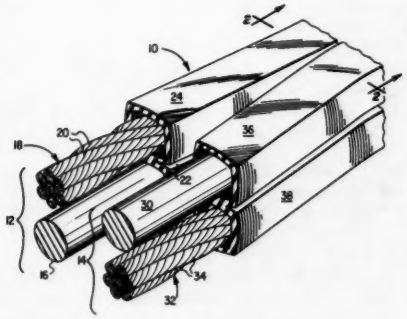
SIGNAL CABLE ASSEMBLY

Noel Lee, 47 W. Park Dr., Daly City, Calif. 94015

Original No. 4,731,506, dated Mar. 15, 1988, Ser. No. 925,831, Oct. 29, 1986. Application for reissue Oct. 4, 1988, Ser. No. 253,227

Int. Cl.[5] H01B *11/02*

U.S. Cl. 174—115 **12 Claims**



7. A signal cable assembly for transferring positive and negative signals between a source and a load, said cable assembly comprising:

(1) a first cable for carrying the positive portion of said signal, said first cable comprising:

(a) a first conductor comprising at least one wire;

(b) a second conductor comprising a plurality of bundles of wires;

(c) the diameter of at least one of said wires of said bundles being different from the diameter of said at least one wire of said first conductor;

(d) a first insulating material extending around said first conductor; and

(e) a second insulating material extending around said second conductor; and

(2) a second cable extending to the side of said first cable in a spaced parallel relationship for carrying the negative portion of said signal, said second cable comprising:

(a) a first conductor comprising at least one wire;

(b) a second conductor comprising a plurality of bundles of wires;

(c) the diameter of at least one of said wires of said bundles being different from the diameter of said at least one wire of said first conductor;

(d) a first insulating material extending around said first conductor; and

(e) a second insulating material extending around said second conductor; and

(3) each of said first conductors of said first and second cables being adapted to carry the relatively low frequency components of said signal and each of said second conductors of said first and second cables being adapted to carry the relatively high frequency portions of said signal.

Re. 33,751

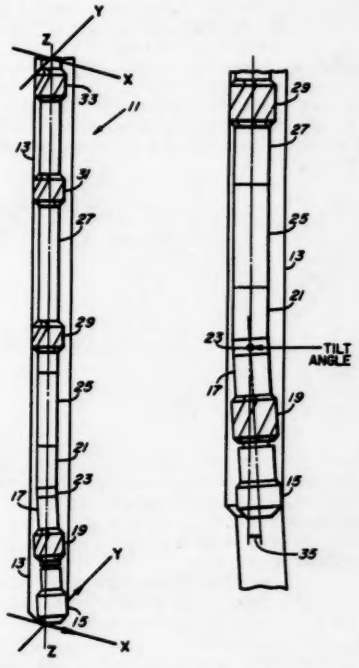
SYSTEM AND METHOD FOR CONTROLLED DIRECTIONAL DRILLING

Bela Geczy, Houston, Tex., and Frank DeLucia, Aberdeen, Scotland, assignors to Smith International, Inc., Houston, Tex.

Original No. 4,667,751, dated May 26, 1987, Ser. No. 786,817, Oct. 11, 1985. Application for reissue May 23, 1989, Ser. No. 356,270

Int. Cl.[5] E21B *7/08*

U.S. Cl. 175—61 **36 Claims**



1. An improved system for controlled directional and straight drilling of a borehole wherein the entire drillstring is rotatable from the surface, including a bottomhole assembly comprised of a drill bit connected to the output shaft of a downhole motor for independent rotation from the drillstring, said motor connected at its uphole end to the drillstring, the improvement in the bottomhole assembly, comprising:

a first, concentric stabilizer, having a preselected diameter slightly smaller than the diameter of the borehole, mounted between the drill bit and motor at a preselected distance from the bit around the output shaft of said downhole motor, said shaft being concentrically located therein;

a [heat] *bent* motor housing connected to the downhole end of said downhole motor that has a bend from its geometric center at a predetermined angle α at its downhole end, thereby offsetting the centerline of said first stabilizer and the centerline of the drill bit face from the borehole centerline by said angle α;

a second concentric stabilizer, having a preselected diameter slightly smaller than the diameter of the borehole, mounted at a preselected distance from said first concentric stabilizer on the drillstring, said drillstring being concentrically located therein; and

a third concentric stabilizer, having a preselected diameter slightly smaller than the diameter of the borehole, mounted at a preselected distance from said second concentric stabilizer on the drillstring, said drillstring being concentrically located therein;

wherein the angle α of the bend in the motor housing, and the diameter and placement of the concentric stabilizers are determined by the desired path of the borehole to be drilled, said system drilling a curved borehole when only the downhole motor is activated, and drilling a straight borehole when the downhole motor is activated and both the drillstring and downhole motor housing are rotated.

Re. 33,752

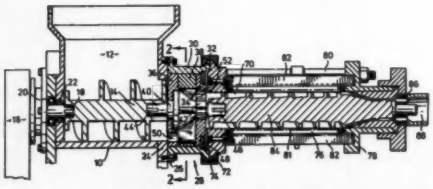
APPARATUS FOR THE SEPARATION OF MIXTURES OF MATERIALS OF DIFFERENT CONSISTENCIES SUCH AS MEAT AND BONE

Werner Poss, 159 Castle Crs., Oakville-Ontario, Canada L6J 5H4

Original No. 4,638,954, dated Jan. 27, 1987, Ser. No. 690,215, Jan. 10, 1985. Continuation-in-part of Ser. No. 513,487, Jul. 13, 1983, abandoned. Application for reissue Nov. 28, 1988, Ser. No. 276,982

Int. Cl.[5] B02C *19/22, 23/16*

U.S. Cl. 241—74 **33 Claims**



1. Apparatus for the separation of a composite mixture of different materials of different consistencies into separate fractions of the different consistencies comprising:

an apparatus body having an apparatus inlet for the composite mixture to be separated and respective outlets for the separated fractions,

a rotary vaned pump having a pump compartment mounted by the said body, the pump compartment having an inlet thereto receiving the mixture from the apparatus inlet into the pump compartment and the pump pressurising it in the pump compartment to an operative separation pressure *of at least 70 Kg/sq. cm. (1000 p.s.i.)*,

said rotary vaned pump having a pump rotor carrying at least one vane rotatable about a rotor axis, said one vane being mounted in a respective radially-extending slot in the rotor and moving radially therein as the rotor rotates, and defining at least two pump chambers in the pump compartment, said pump chambers being formed about a chamber longitudinal axis radially displaced from said rotor axis so that each pump chamber decreases in volume as the pump vane moves from the pump means inlet toward the pump means outlet and increases in volume as the pump vane moves from the outlet towards the inlet,

separator screen means mounted by the said body against a front face of which the pressurised mixture is delivered for the corresponding softer first fraction thereof to pass through the screen to a rear face thereof and for the remaining second harder fraction to be retained by the screen, and

means connecting at least the front face of the screen to a respective outlet for the respective separated second harder fraction,

said separator screen means and the outlet for the second harder fraction maintaining the pressure of the pressurized mixture at [an] *said* operative separation pressure.

Re. 33,753

AUSTENITIC STEEL WITH IMPROVED HIGH-TEMPERATURE STRENGTH AND CORROSION RESISTANCE

Sergio Vacchiano, Rome; Giovanni Lanfranco, St. Vincent, and Roberto Gubiotti, Terni, all of Italy, assignors to Centro Sviluppo Materiali S.p.A., Rome, Italy

Original No. 4,824,636, dated Apr. 25, 1989, Ser. No. 22,204, Mar. 5, 1987. Application for reissue Dec. 29, 1989, Ser. No. 459,304

Claims priority, application Italy, Mar. 17, 1986, 47782 A/86

Int. Cl.[5] C22C *38/44*

U.S. Cl. 420—47 **2 Claims**

1. Austenitic steel with improved and long-term constant high-temperature strength and resistance to aggressive agents, [comprising] *consisting essentially of* the following elements in % by weight:

0.40–0.65 carbon
0.35–0.60 nitrogen
[2.0–3.0 manganese]
about 2.30 manganese
22.0–24.0 chromium
7.5–8.5 nickel
0.7–1.3 molybdenum
0.6–1.2 vanadium
0.7–1.5 niobium
up to 0.3 silicon
up to 0.03 sulphur
up to 0.025 phosphorus

balance essentially iron, carbon, nitrogen, vanadium, molybdenum and niobium being intercorrelated by specific ratios, said specific ratios being expressed in atomic fractions through the following mathematical relations:

(A) $Nb+V/C+N=0.25-0.45$
(B) $N/C=0.60-1.10$
(C) $V/Nb=0.50-2.0$
(D) $Mo/C=0.15-0.25$.

Re. 33,754

GREASE COMPATIBLE EXTENDED POLYURETHANES

Melvin Brauer, East Brunswick; William J. Downey, Linden; Frank C. Naughton, Mountainside, and Jerry C. Chao, Bayonne, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Original No. 4,596,743, dated Jun. 24, 1986, Ser. No. 713,378, Mar. 19, 1985. Continuation-in-part of Ser. No. 553,196, Nov. 18, 1983, Pat. No. 4,533,598. Application for reissue Apr. 20, 1990, Ser. No. 512,310

Int. Cl.[5] C08K *5/01, 5/10;* **C08L** *75/04*

U.S. Cl. 428—380 **27 Claims**

1. A grease compatible cyclic olefin extended polyurethane composition comprising from about 10 to 90 parts of the liquid reaction product of an organic polyisocyanate with a polyol in the presence of a liquid cyclic olefin, the polyisocyanate polyol reaction product being present in a range from about 8 to 99 parts by weight, and said cyclic olefin being present in range of from about 92 to 1 part by weight, and from about 90 to 10 parts by weight of a plasticizer having a total solubility parameter of between about 9.1 and 9.7 [or between about 8.3 and 8.9].

12. A process for providing a fluid impervious protective seal around an insulated electrical device which comprises introducing the components of the composition of claim 1 into a confined space surrounding the section of a device to be protected and allowing said composition to cure to a gel.

Re. 33,755

ESTER PLASTICIZERS FOR POLYURETHANE COMPOSITIONS

William J. Downey, Linden; Melvin Brauer, East Brunswick, and Jerry C. Chao, Bayonne, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Original No. 4,666,968, dated May 19, 1987, Ser. No. 837,554, Mar. 3, 1986. Continuation-in-part of Ser. No. 713,377, Mar. 19, 1985, abandoned. Application for reissue Oct. 30, 1989, Ser. No. 428,700

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[5] C08K *5/10, 5/12;* C08L *75/04*

U.S. Cl. 524—296 15 Claims

1. A polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyisocyanate and a polyol having an equivalent weight above 250 in the presence of about 90 to 10 parts by weight of an ester plasticizer compound having a total solubility parameter of [between about 8.3 and 8.9] or between about 9.1 and 9.7.

PLANT PATENTS

GRANTED NOVEMBER 26, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,717

ROSE PLANT JACORAL

William A. Warriner, Tustin, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Apr. 23, 1990, Ser. No. 512,990
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dwarf upright habit of growth, dark green glossy foliage, and unusual pink flower color with darker pink at the center.

7,718

ROSE PLANT—MEICAUF VARIETY

Marie-Louise Meilland, deceased, late of Antibes, France by Jean-Pierre Le Naour, Legal Representative, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 22, 1990, Ser. No. 526,989
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms continuously and in abundance attractive long lasting double blossoms which are turkey red on the upper surface and cardinal red on the under surface,
(b) exhibits an erect growth habit,
(c) exhibits very vigorous vegetation,
(d) is particularly suited for growing in parks and gardens, and
(e) is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

7,719

JASMINE MULTIFLORUM 'TIFFANY'

Wesley C. Fisher, Sebring, Fla., assignor to Hidden Acres Nursery Inc., Sebring, Fla.

Filed May 17, 1990, Ser. No. 526,998
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—54 1 Claim

1. A new and distinctive variety of *Jasminum multiflorum* substantially as shown and described herein, characterized particularly as to novelty by the random pattern of contrasting yellow colors as variegations on the green leaves, with hardy, profuse production, other characteristics being typical of *Jasminum multiflorum* including pubescence, and delicate fragrance of the flowers which are white.

7,720

VARIETY OF GERANIUM NAMED MONIQUE

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Etablissement Guillou Freres Jacques, Bernard et Maurice, Saint-Malo, France

Filed Aug. 27, 1990, Ser. No. 572,441
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct ivy Geranium, as shown and described herein.

7,721

VARIETY OF GERANIUM NAMED YVETTE

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Etablissement Guillou Freres Jacques, Bernard et Maurice, Saint-Malo, France

Filed Aug. 27, 1990, Ser. No. 572,442
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct ivy Geranium as shown and described herein.

7,722

ALSTROEMERIA PLANT NAMED ALICIA

Erwin Mojonnier, 237 Quail Dr., Encinitas, Calif. 92024

Filed Jul. 24, 1990, Ser. No. 556,402
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Alstroemeria plant named Alicia, as illustrated and described.

7,723

AFRICAN VIOLET NAMED KATY

Eiichi Yoshida, P.O. Box 4836, Hayward, Calif. 94540-4836

Filed May 14, 1990, Ser. No. 524,127
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named 'Katy', as described and illustrated, and particularly characterized by its profuse flowering, upright flower stems, compact bouquet, vigorous growth habit, flowers 11 to 12 weeks after potting and its long lasting and non-dropping flowers which gives the plant a substantially continuous beauty.

7,724

CHRYSANTHEMUM PLANT NAMED GOLD RUSH

Janet S. Fuess, 9011 Red Hill Rd., New Hartford, N.Y. 13413

Filed Jun. 26, 1990, Ser. No. 543,381
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Gold Rush, as described and illustrated.

7,725

CHRYSANTHEMUM PLANT NAMED FORT KNOX

Janet S. Fuess, 9011 Red Hill Rd., New Hartford, N.Y. 13413

Filed Jun. 26, 1990, Ser. No. 543,382
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Fort Knox, as described and illustrated.

7,726

POINSETTIA PLANT 'C-27 PINK'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed May 24, 1990, Ser. No. 528,237
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, characterized by its large, erect and bright pink flower bracts and stiff stems.

7,727

GUZMANIA PLANT NAMED TWILIGHT

Gerardus J. Bak, Assendelft, Netherlands, assignor to Corn. Bak B.V., Netherlands

Filed Apr. 24, 1990, Ser. No. 513,881
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A plant of a new and distinct cultivar of Guzmania plant named 'Twilight', as illustrated and described.

PATENTS

GRANTED NOV. 26, 1991

ERRATA

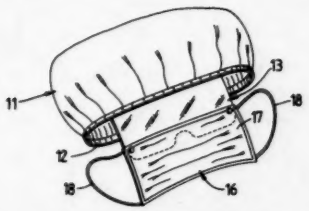
For CLASS	See PATENT NO.
5-002	5,067,183
62-515	5,067,322
229-214	5,067,613
229-123	5,067,614
229-230	5,067,615
241-036	5,067,666
359-350	5,067,781
359-202	5,067,782
385-060	5,067,783
385-053	5,067,784
385-038	5,067,785
385-013	5,067,786
385-050	5,067,787
385-002	5,067,788
385-027	5,067,789
385-100	5,067,790
385-101	5,067,791

PATENTS

GRANTED NOVEMBER 26, 1991

GENERAL AND MECHANICAL

5,067,174
PROTECTIVE HEADGEAR
Albert E. Ritchey, 2109 Cloud Croft Cir., Birmingham, Ala. 35216, and Thomas C. Reeves, 3501 Mountain La., Birmingham, Ala. 35213
Continuation-in-part of Ser. No. 356,447, May 24, 1989. This application Sep. 4, 1990, Ser. No. 576,963
Int. Cl.[5] A42B *1/06*
U.S. Cl. 2—10 **10 Claims**



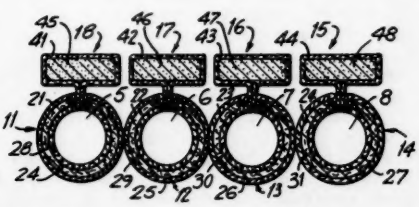
1. Apparatus for providing a protective cover to the head of a health care professional or like user exposed to a contaminating environment comprising:

(a) a protective head covering means made from a spun polypropylene fabric having an elastomeric band encircling the head and circumscribing a singular opening in a protective covering such that the user's head is situated within the opening and covered above the elastomeric band means by the protective covering;

(b) A clear visor extending across the face of the user having a strip attached along an upper margin thereof made from a hooked portion of hook and loop material, wherein said strip detachably engages said polypropylene fabric in hook and loop relation being easily detached and reattached; and

(c) a face mask attached to the visor at a lower periphery thereof and providing means for attachment of said face mask and said visor to the face of the user.

5,067,175
PADDED GARMENT
Danny Gold, 23 Repulse Bay Rd., Apt. 4B, Hong Kong, Hong Kong
Filed Aug. 31, 1990, Ser. No. 576,614
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—16 **20 Claims**



1. A padded garment for covering at least a portion of a body part, comprising:

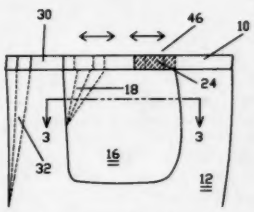
garment panel means for forming an outer surface of the garment, the garment panel means including at least first and second panel members, each of the first and second panel members including a panel section and a seam tolerance section separated by a seam location;

padding means for protecting at least a portion of the body part;

chamber means coupled to the first and second panel members at their respective seam locations for creating a chamber for containing the padding means in a position proximate the outer surface of the garment; and

coupling means for joining the chamber means and the seam locations of the first and second panel members, the chamber means being joined to the garment panel means between the seam locations of the first and second panel members.

5,067,176
SELF-ADJUSTING TROUSER WAISTBAND SYSTEM
Vincent Carabillo, 90 Trenton Ave., Clifton, N.J. 07011
Filed Oct. 15, 1990, Ser. No. 597,839
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—237 **12 Claims**



1. A self-adjusting trouser waistband system, comprising:

(a) a pair of trousers having a circumferential waist having respective ends starting at respective opposite sides of a trouser fly;

(b) left and right pockets, including therein extensible means near the tops thereof, for stretching horizontally, said means located within both an outside surface of said pocket and an inside surface of said pocket;

(c) left and right forward linear elastic elements each having first and second ends, said first ends secured to respective opposite side areas of said trouser fly;

(d) left and right forward non-extensible linear elements, each having first and second ends, each first end of said forward linear elements secured in the area of said trouser fly, lower portions of each of said forward non-extensible elements secured to said outer surface extensible means of said pocket;

(e) left and right rear non-extensible linear elements, each having first and second end, each of said first ends secured to said second ends of said forward elastic elements, and said second end secured to said circumferential waist of the trousers at a region proximal to the rear of each pocket, lower portions of each of said rear non-extensible elements secured to said inner surface extensible means of said pocket; and

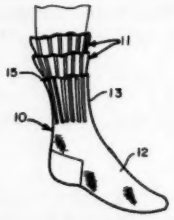
(f) left and right rear linear elastic elements having first and second ends, said first ends secured to said second ends of said forward non-extensible elements and said second ends secured to said circumferential trouser waist in said region of the rear of each pocket,

whereby the horizontal dimension of said trouser waist and pocket areas will expand and contract in response to changes in the effective girth of the waist of the user resulting from changes of girth resulting from eating of meals, time of day, sitting, bending, standing and other causes.

5,067,177
CUFF-LIKE TUBULAR EXTENSIONS FOR WEARING APPAREL

Margaret L. Binder, 7334 Palmleaf La., Worthington, Ohio 43235

Filed May 18, 1990, Ser. No. 525,409
Int. Cl.[5] A41B *11/00, 7/00*
U.S. Cl. 2—239 2 Claims



1. An article of wearing apparel comprising

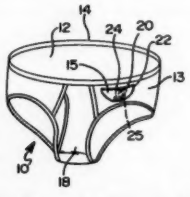
a sock having a foot portion for receiving a person's foot and an ankle portion of elongated tubular configuration connected with and extending from said foot portion having a marginal end portion open at a terminal end through which a person's leg extends, said marginal end portion sized to be in constrictive engagement with a person's leg extending therethrough,

a cuff element of elongated, open-ended tubular configuration having first and second marginal end portions, said cuff element positionable on a person's leg in axially aligned relationship to said ankle portion with said cuff element's first marginal end portion projected a distance into the marginal end portion of said ankle portion with said second marginal end portion extending a distance axially outward from said ankle portion whereby it is exposed for visual observation, said cuff element's first marginal end portion sized to constrictively engage with the wearer's leg for retention thereon in substantially fixed position.

5,067,178
UNDERGARMENT

Michael P. Katchka, 180 Mohawk, Pontiac, Mich. 48053

Continuation-in-part of Ser. No. 210,495, Jun. 23, 1988. This application Sep. 18, 1989, Ser. No. 408,844
Int. Cl.[5] A41B *9/00;* A41C *3/00*
U.S. Cl. 2—250 17 Claims



1. An undergarment for retaining personal effects in a secure manner during the normal course of activities of a wearer of the undergarment, the undergarment comprising:

(a) a body portion to be worn about the trunk below the waist of the wearer, the body portion being made of a body-portion material;

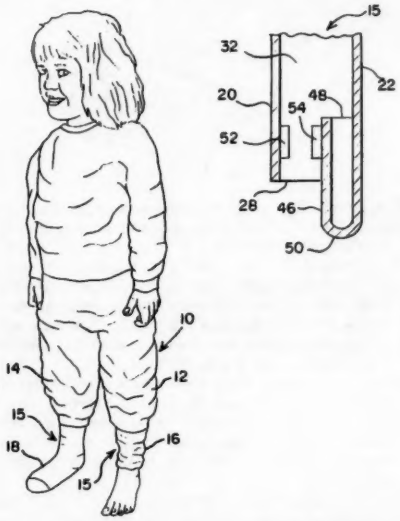
(b) a waistband that is affixed to the body portion, the waistband being wearable about the waist of the wearer; and

(c) a pocket being secured to the body portion, the pocket being made of a pocket material which is different from the body-portion material, the pocket material being elastic in one direction only, the pocket having an opening disposed across a portion thereof, an elasticized band of material being disposed across the pocket adjacent the opening, the elasticized band of material being stretched taut across the pocket opening, the top portion of the pocket having a double density of the pocket material.

5,067,179
CONVERTIBLE GARMENT LEG CONSTRUCTION

Walter S. Wormser, Highland Park, Ill., assignor to The Wormser Company, Northbrook, Ill.

Filed Nov. 5, 1990, Ser. No. 609,411
Int. Cl.[5] A41D *10/00, 27/10*
U.S. Cl. 2—269 27 Claims



21. A convertible garment leg construction, suitable for use in a child's pajamas, which comprises in combination a garment leg having an open bottom end, elongated front and rear panels of stretchable material joined at longitudinal edge seams to provide an elongated tubular sleeve having a first open end that is attached to said garment leg open bottom end and is circumferentially stretchable in a direction transverse of said longitudinal edge seams, the length of the sleeve being such as to provide a foot receiving sock element at a second sleeve open end spaced from said first sleeve open end when the sleeve is extended to its full length, the second open end of the sleeve defining thereon an elongated cuff located partially within the sleeve across an inside surface of said rear panel and having one transverse folded edge thereof integral with said rear panel, the cuff having longitudinal side edges attached to spaced portions of the sleeve at seams that are extensions of the said longitudinal edge seams, said longitudinal side edges and seams of the cuff extending axially of the sleeve and tapering inwardly from an upper free edge of the cuff to the folded edge of the cuff that is integral with the rear panel, said seam lines at the side edges of the cuff being spaced from each other so as to provide that the elongated cuff is stretchable with the circumferentially stretchable sleeve, the length of the free edge of the cuff extending along substantially one-half of the circumferential periphery of the sleeve, the cuff being manipulatable between a first, stored-away position in which it is adjacent the interior of the sleeve so as not to obstruct the second open end of the tubular sleeve and so as to permit the stretchable sleeve and cuff to contract to form a neat anklet-cuffing for the garment leg, and a second sleeveclosing position where the cuff

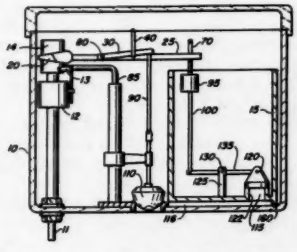
extends across the second open end of the sleeve to close same, a hook-and-loop type fastener unit having a first fastener element containing a plurality of loops and having a second fastener element containing a plurality of hooks for grippingly engaging said loops, one of said fastener elements being mounted on an inside of said sleeve front panel proximate said second open end of the sleeve and the other one of said fastener elements being mounted on an inwardly facing outer surface of said cuff in a position across from said one of said fastener elements and located to provide that a wearer of said garment may manipulate said front panel and said cuff to bring said fastener elements into gripping engagement to close off said sleeve second open end and provide said foot receiving sock element, and a third fastener element containing a plurality of hooks mounted on an outside surface of said sleeve front panel, and positioned proximate said sleeve second open end.

5,067,180

METHOD AND APPARATUS FOR CONSERVING WATER USED IN THE DISPOSAL OF HUMAN BODY WASTE

Kenneth J. Figeroid, 474 Wilmer St., Carmichael, Calif. 95608

Filed Apr. 17, 1990, Ser. No. 510,079
Int. Cl.[5] E03D *1/14*
U.S. Cl. 4—326 **18 Claims**



1. A water saving apparatus for toilets, comprising:

(a) a secondary water container, said secondary water container having a bottom and an open top, said bottom including an opening;

(b) a secondary valve, said secondary valve positioned over said opening, said secondary valve being operable to open and close said opening;

(c) a pressure arm, said pressure arm having a first end and a second end, said first end coupled to said secondary valve;

(d) a float arm, said float arm coupled to said second end of said pressure arm;

(e) a base, said base attached to said bottom of said secondary water container in proximity to said opening, said pressure arm pivotally coupled to said base at a point near the longitudinal midpoint along said pressure arm;

(f) a float, said float attached to said float arm;

(g) attachment means for attaching said secondary water container to a toilet of the type having a primary water container, waste containment means for containing human body waste, and a primary valve for discharging water from said primary water container into said waste containment means;

(h) first actuating means for actuating said primary valve;

(i) second actuating means for actuating said secondary valve; and

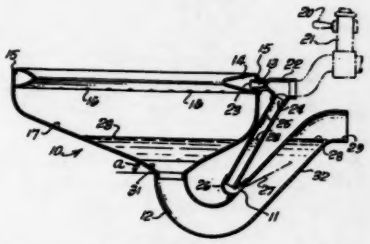
(j) coupling means for coupling said secondary actuating means to said first actuating means whereby the user can selectively actuate said secondary valve independently or actuate said primary valve and said secondary valve concurrently.

5,067,181

BLOW OUT TOILET WITH LOW WATER VOLUME USAGE

V. Walter Hafner, and Keith D. Marshall, both of Whittier, Calif., assignors to Acorn Engineering Company, Los Angeles, Calif.

Filed Mar. 13, 1990, Ser. No. 492,953
Int. Cl.[5] E03D *11/18*
U.S. Cl. 4—425 **8 Claims**



1. An improved blow out toilet of the type having a toilet bowl, a trap affixed to the base of the bowl and leading downwardly, then curving upwardly to a straight portion at an angle of about 45 and then curving to approximately a horizontal orientation, which trap permits water to fill the bowl to a predetermined level, a rinse water outlet ring near the top of the interior of the bowl, said rinse water outlet ring having rinse water outlet openings, a rinse water nozzle including an orifice with its outlet directed into the rinse water outlet ring, a flush water nozzle including an orifice positioned in the trap below the predetermined water level and aimed rearwardly therein and a flush valve and piping providing a predetermined volume of water to be less than 1.6 gallons simultaneously to said nozzles when opened, wherein the improvement comprises:

a shallow angled toilet bowl base smoothly shaped that no more than about 0.66 gallon of water is held in the bowl and trap while providing an area of water coverage of at least about 10″×12″;

a generally frusto-conically shaped ring at the base of the shallow angled toilet bowl providing a transition between the bowl and the trap;

a rinse water nozzle orifice between 0.21 and 0.26 inch in diameter;

a flush water nozzle orifice between 0.21 and 0.26 inch in diameter, said flush water orifice being mounted in the top of the trap at the beginning of the straight portion thereof.

5,067,182

SWIMMING POOL COVER

Lester M. Koelsch, 1100 Via Formia, Punta Gorda, Fla. 33950

Filed Aug. 3, 1990, Ser. No. 563,029
Int. Cl.[5] E04H *4/00*
U.S. Cl. 4—498 **19 Claims**

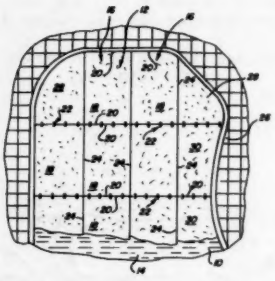
1. A protective floating pool cover comprising:

a plurality of buoyant rectangular panels, said panels having parallel ends and parallel sides, said ends having a hinge portion with hinge pin receiving apertures;

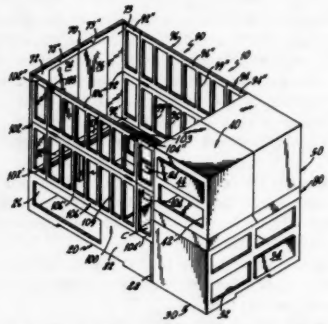
a hinge link received in the hinge portions of adjacent panels, said hinge links having spaced hinge pin apertures; and

a hinge pin received in said hinge pin apertures in said hinge portions and said hinge links, said hinge pin pivotally joining the ends of adjacent panels to permit swinging of any one panel in either direction relative to the adjacent panel until a selected one of either the upper or lower faces of said adjacent panels are in contact with each other, said panels being swingable from a storage position

in which said panels are folded over in an accordion fashion, one on top of the other, to an open use position floating on the liquid surface of a pool with the ends adjacent each other and said panels in alignment with each other.



5,067,183
CONVERTIBLE INFANT BED ASSEMBLY
Omar Urquiola, 235 SW. Le Jeune Rd., Miami, Fla. 33134
Filed Mar. 4, 1991, Ser. No. 663,967
Int. Cl.[5] A47D *11/00*
U.S. Cl. 5—2.1 **12 Claims**



1. A set of furniture pieces that are convertible from a crib to a youth bed with a dresser assembly, all resting on a horizontal floor, comprising in cooperative combination:

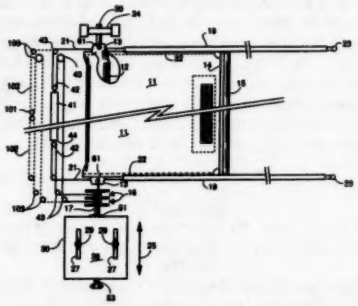
A. a base assembly including two lateral and two shorter end members having an upper edge and forming a rectangular frame and further including platform means mounted on top of said base assembly defining a horizontal plane, spaced apart from said floor and further including extension members removably mounted to said lateral members so that the length of said rectangular frame can be readily extended;

B. rail means removably mounted on the lateral members of said base assembly as an extension thereof and said rail means includes right and left rail assemblies and each one of said rail assemblies having one section comprising two rail members that are hingedly mounted to each other;

C. a head board assembly removably mounted on the upper edge of one of said end members of said base assembly as an extension thereof and also removably attached to said rail assemblies;

D. a lower chest assembly wherein its width is substantially the same as the length of said shorter end members, having a top surface and said lower chest assembly having a rear wall that is removably mounted to said other end member of said base assembly.

5,067,184
COVER DRUM HAVING TAPERED ENDS AND AUTOMATIC SWIMMING POOL COVER
Harry J. Last, 1246 Birchwood Dr., Sunnyvale, Calif. 94089
Continuation-in-part of Ser. No. 258,000, Oct. 17, 1988, Pat. No. 4,939,798. This application Mar. 16, 1990, Ser. No. 494,564
Int. Cl.[5] E04H *4/10*
U.S. Cl. 4—502 **37 Claims**



1. A system for extending and retracting a flexible rectangular cover having beaded side edges back and forth across a liquid contained in a pool where the cover is supported by and slides on the surface of the liquid, and is anchored by its respective beaded side edges, each of which are captured and slide within a "C" channel of a pool cover track secured along opposite side edges of the pool, comprising, in combination:

a rigid structural boom spanning across the pool secured to the front edge/end of the cover for carrying and supporting the front edge of the cover above the liquid surface as the cover is drawn back and forth across the pool;

means for supporting the rigid boom as it translates back and forth across the pool;

a cylindrical cover drum having a length less than the width of the cover supported for rotation about its longitudinal axis at one end of the pool by axles extending from its respective ends, the cover winding and unwinding from around the periphery of the drum as it retracts and extends across the pool;

a conically tapering hub located at each end of the cover drum coaxially rotating with the cover drum around which the respective beaded side edges of the cover wind and unwind as the cover retracts and extends across the pool;

a cable extending from the respective beaded side edges at the cover's front corners, the cables extending from the front corners of the cover to wind and unwind from around at least one rotatable cable take-up reel;

drive means mechanically coupled to one axle supporting the cover drum and to the cable take-up reel for rotating the cover drum and the cable take-up reel to extend and retract the cover across the pool;

means for translating the cover drum and conically tapering hubs longitudinally along the longitudinal and rotational axis of the cover drum simultaneously increasing a diameter which one beaded side edge of the cover winds about one hub and decreasing a diameter which the other side edge of the cover winds about the other hub.

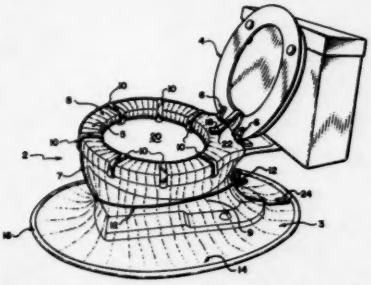
5,067,185
TOILET BOWL PROTECTOR
Frederick H. Kohler, 13527 98th Avenue, Surrey, British Columbia, Canada V3T 1B9
Filed Jun. 19, 1990, Ser. No. 540,574
Int. Cl.[5] A47K *13/00*
U.S. Cl. 4—661 **7 Claims**

1. A removable toilet bowl protector for use with a toilet

bowl having an upper rim, a waist portion and a base portion, said protector comprising:

(a) a flexible waterproof sheet which is adapted to cover the exterior surfaces of a toilet bowl and which sheet has a hole in the central area thereof, a portion of the sheet around the hole being adapted to fit about an upper rim of the toilet bowl;

(b) attachment means for enabling the portion around the hole to be releasably attached to the upper rim of the toilet bowl;



(c) a bead around at least a portion of the exterior circumference of the sheet, the bead being adapted to rest on a floor surrounding the base portion of the toilet bowl;

(d) an intermediate portion adapted to fit around the waist portion of said bowl;

(e) wherein said portion around the hole attached to the rim and said intermediate portion fitting around the waist portion, said bead will extend completely around the base portion of the bowl.

5,067,186

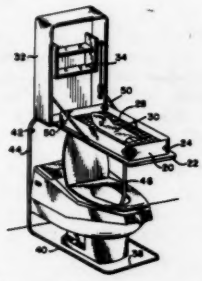
BABY BIDET APPARATUS WITH RETRACTION AND HEIGHT ADJUSTMENT MEANS

Glenn Ayers, 2581 NE. 10 Ct., Pompano Beach, Fla. 33062

Filed Jun. 2, 1989, Ser. No. 360,767

Int. Cl.[5] A47K *3/00*

U.S. Cl. 4—665 **1 Claim**



1. An infant bath comprising:

an open container having a bottom and sides;

said bottom further having a sloped upper surface with the lowest portion of said sloped surface converging upon a vent;

a draining platform horizontally suspended above said bottom, and a body platform affixed to said draining platform, said body platform further comprising an inclined support surface above said draining platform;

a storage console having at least one convenience shelf, with hinge and support arm means for positioning the container relative to the console horizontally and alternately vertically concealably nested within said console;

the console further supported on a frame having a base with at least one telescoping vertical member having height adjustment means.

5,067,187

SOFA BED WITH PIVOTABLE AND SLIDABLY ADJUSTABLE BACK REST

Rosario Messina, Seregno, Italy, assignor to Flou S.p.A., Meda, Italy

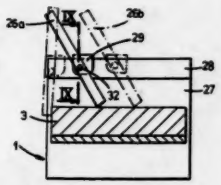
Division of Ser. No. 404,871, Sep. 8, 1989, Pat. No. 5,038,422.

This application Apr. 12, 1991, Ser. No. 685,232

Claims priority, application Italy, Sep. 13, 1988, 21916 A/88

Int. Cl.[5] A47C *17/04*

U.S. Cl. 5—12.1 **4 Claims**



1. A sofa bed comprising:

a seat-back adjustable in position;

a pair of arm rests lateral to said seat-back and formed with upper edges;

means for adjusting said position of said seat-back;

a pair of U-shaped saddles engaged upon said upper edges of said arm rests and connected in a pivoted manner to sides of said seat-back said saddles adapted to be moved forwardly or rearwardly on said arm rests.

5,067,188

SLIDING TRANSFER DEVICE

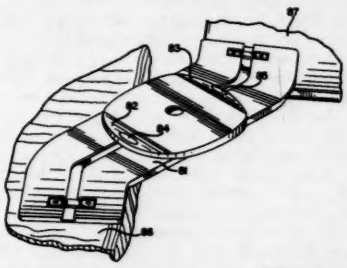
Robert F. Brantman, 1400 N. Waukegan Rd., Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 519,290, May 4, 1990, Pat. No. 4,987,621. This application Jan. 17, 1991, Ser. No. 642,416

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] A61G *7/053, 7/10*

U.S. Cl. 5—81 R **17 Claims**



1. A portable sliding transfer device comprising a seat that is adapted to support a human user for movement between one body support, such as a bed, to another body support, such as a wheelchair, said device comprising:

a) a lower support plate having a substantially flat top surface, and ends adapted to be removably positioned proximate and in contact with said body supports, and

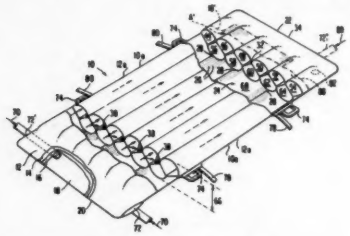
b) an upper seat which is attached to the lower support plate such that the upper seat is slidable over the top surface of the lower support plate and the upper seat is pivotable with respect to the top surface of the lower support plate.

5,067,189

AIR CHAMBER TYPE PATIENT MOVER AIR PALLET WITH MULTIPLE CONTROL FEATURES

Robert E. Weedling; William R. Swallen, both of c/o LCI Medical, Inc., P.O. Box 100, Rte. 191 at Rte. 33 Interchange, Stockertown, Pa. 18083; Raynor Johnson, 100 Dayett Mills Rd., Newark, Del. 19702; Jack Wegener, Rte. 2, Box 195, Preston, Md. 21655, and David T. Davis, R.D. 1, Box 356A, Easton, Pa. 18042

Filed Apr. 11, 1990, Ser. No. 507,534
Int. Cl.[5] B65G 7/06; A61G 7/14
U.S. Cl. 5—81 R 26 Claims



1. A patient mover air pallet for frictionless movement of a patient over an underlying, relatively fixed support surface, said patient mover air pallet comprising:

top, intermediate and bottom thin flexible sheets,

means for sealing given sheets together linearly to define a plenum chamber between said intermediate and bottom sheets,

at least one backing member cavity between said top sheet and said intermediate sheet, said bottom thin flexible sheet including a portion defined by the footprint of the load having a plurality of closely spaced small diameter pin hole type perforations opening directly into the plenum chamber and directly onto said support surface,

air inlet means communicating with the plenum chamber at one end thereof for permitting low pressure air flow pressurization of the plenum chamber for initially jacking the load and for subsequent discharge through the perforations to create a thin air film between the bottom thin flexible sheet and the support surface,

means including said top thin flexible sheet defining a semi-rigid backing member so as to define with the plenum chamber air dispersion means for insuring air flow throughout the plenum chamber when the air pallet is under load at the time of air pressurization of the plenum chamber and constituting with said bottom thin flexible sheet, means for controlling pillowing of the thin flexible sheet material to permit jacking of the semi-rigid backing member and the load while preventing ballooning of the thin flexible sheet material, wherein said semi-rigid backing member permits deflection of the patient mover somewhat to conform the patient mover to depressions within the support surface to permit transport of the patient via the patient mover air pallet over said support surface wherein said top thin flexible sheet is sealed to said intermediate thin flexible sheet along longitudinal parallel lines at laterally spaced positions across the surface of the intermediate thin flexible sheet and at both ends thereof to form a series of longitudinally extending tubes, and wherein means are provided for supplying air under pressure to the individual tubes formed thereby in addition to air pressurization of the plenum chamber such that the tubes cradle the patient while facilitating transport of the patient over the support surface on the frictionless air film,

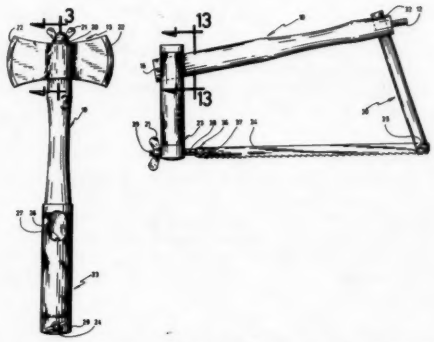
the improvement comprising means for substantially restricting lateral shrinkage of the portion of the plenum chamber in the area of said perforations parallel to the plane of the developed air film for maintaining the footprint of the air film generally equal to that of the footprint of the load to insure stable support of the patient on the patient mover air pallet, and for preventing loss of said air film and grounding of the air pallet to the underlying support surface.

5,067,190

COMBINATION TOOL ASSEMBLY

Yvon Gagnon, 231, 1st Avenue, Saint-Honoré , Canada G0V 1L0

Filed Apr. 23, 1990, Ser. No. 512,804
Int. Cl.[5] B25F 1/02
U.S. Cl. 7—149 5 Claims



1. A dismantleable bucksaw defining an open quadrangular frame in assembled condition and a single tubular body in dismantled condition, said bucksaw consisting of:

(a) an elongated saw blade having one and another ends;

(b) a tubular hollow handle, defining a closed end and a opposite mouth portion provided with an axially offset, first, transverse through-channel;

(c) first securing means, operative in said assembled condition for releasably anchoring said blade one end to said handle closed end transversely thereof;

(d) an elongated brace member, defining one and another end;

(e) second securing means, operative in said assembled condition for releasably anchoring said brace member one end to said blade other end;

(f) an elongated hollow shaft, defining a mouth portion and a closed end portion having an axially offset, second, transverse through-channel; wherein in said dismantled condition, said brace member and blade are fully engaged into the hollow of said shaft through said mouth portion thereof, and the handle is then fitted by its mouth portion onto said shaft mouth portion exteriorly thereof to close the latter and thus to fully enclose the brace and blade therewithin; and

wherein in said assembled condition, said brace member endwisely releasably engages said second through-channel, said shaft endwisely releasably engages said first through-channel,

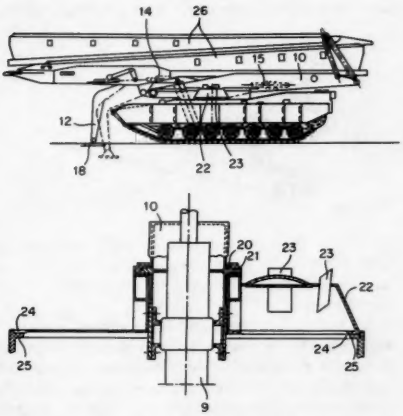
and said brace member makes an acute angle with respect to said blade.

5,067,191

BRIDGE LAYER

Walter Kinzel, Mainz, and Eberhard Illgner, Niederolm, both of Fed. Rep. of Germany, assignors to MAN Gutehoffnungshütte AG, Oberhausen, Fed. Rep. of Germany

PCT No. PCT/EP88/01026, § 371 Date Apr. 25, 1990, § 102(e) Date Apr. 25, 1990, PCT Pub. No. WO90/05215, PCT Pub. Date May 17, 1990
PCT Filed Nov. 12, 1988, Ser. No. 466,391
Int. Cl.[5] E01D *15/12*
U.S. Cl. 14—2.4 8 Claims



1. A bridge laying vehicle with laying means for laying stacked bridges or bridge sections, comprising: an armored tracked vehicle having a gun turret ring with gun turret removed, said gun turret being mounted on the ring when not removed therefrom; a movable arm at front of said vehicle and said laying means and having means for advancing bridges or bridge sections; a movable boom at the rear of said laying means and having supporting means; guide means and carriage means for displacing said movable boom back and forth on said guide means; said guide means having a ring for mounting said guide means on said gun turret ring and removing said guide means from said gun turret ring.

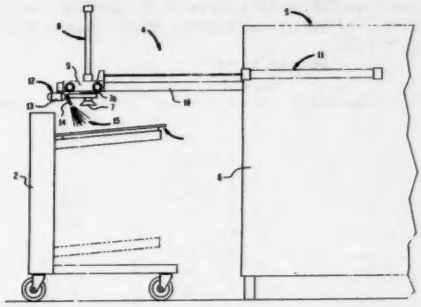
5,067,192

AUTOMATIC MACHINE FOR WASHING SELF-SERVICE TRAYS AND SIMILAR ITEMS

Ferdinando Guelfi, and Elio Lippi, both of Lucca, Italy, assignors to Colged S.p.A., Lucca, Italy

Filed Dec. 4, 1990, Ser. No. 622,023
Claims priority, application Italy, Dec. 4, 1989, 9577 A/89
Int. Cl.[5] A47L *5/38*
U.S. Cl. 15—302 4 Claims

1. Improvements to an automatic machine for washing self-service meal trays, comprising a sucker (7) operated by pneumatic cylinders (8, 11) and serving to pick up soiled trays (3) from a first stacking trolley (2), and a conveying system by which the soiled trays are taken through a washing and drying tunnel (5) toward a second trolley (2) on which the washed and dried trays are restacked, wherein the improvements comprise a cleaning device (12) occupying a position coinciding substantially with that of the sucker (7), said device comprising a reservoir (13) charged with compressed air, and means (14) associated with the reservoir by which a jet of compressed air (15) is directed at each successive tray (3*a*) immediately prior to the approach of the sucker, in such a way as to clear the tray of any residual waste matter and enable the sucker to establish a firm grip, said conveying system (16, 17) consisting of a horizontally disposed power driven belt extending the entire length of the tunnel (5), on which the trays (3) remain in position without the use of constraints, means being further provided for emptying the trays of rinsing water before being dried, installed internally of the tunnel (5) and beyond the washing station (18).

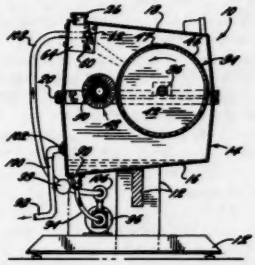


5,067,193

ROTARY PRINTING PLATE WASHING APPARATUS

Daniel J. Thomas, Raleigh, N.C., assignor to Container Graphics Corporation, Cary, N.C.

Filed Jul. 26, 1990, Ser. No. 558,692
Int. Cl.[5] B08B *11/02*; B41N *3/04*
U.S. Cl. 15—88.3 19 Claims



1. Apparatus for washing arcuate printing plates, comprising:

an elongate housing, said housing including a lower trough-like section, and an upper cover section mounted for movement between a closed position wherein said cover section overlies said trough-like section and an open position wherein said cover section permits access to the interior of said housing;

an elongate plate supporting drum mounted within said housing for rotation about its longitudinal axis, said drum being adapted to support at least one printing plate upon its peripheral surface;

drive means for imparting said rotation to said drum, and to a printing plate supported thereon;

a source of clean plate washing fluid;

a fluid spray manifold connected to said fluid source, said spray manifold being mounted within and movable with said cover section of said housing, and at desired times spraying fluid from said source onto a printing plate supported by said drum; and

a brush mounted within said housing in generally parallel adjacent relationship to said plate supporting member,

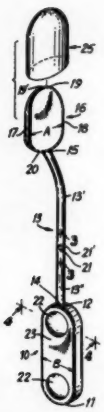
said brush being engageable with the printing plate carried by said drum.

5,067,194

SANITARY DEVICE

Anne Rosenfeld, 83-15 Lefferts Blvd., Kew Gardens, N.Y. 11415, and Frank Barkman, 35-11 85th St., Jackson Heights, N.Y. 11372

Filed Apr. 10, 1989, Ser. No. 335,914
Int. Cl.[5] A47K *10/16*
U.S. Cl. 15—144 A 8 Claims



1. A sanitary device comprising a handle having a free proximal end and a distal end for mounting a shaft, a shaft extending from the distal end of the handle and having a proximal end fixed to the distal end of the handle and a distal end for mounting a wiper member, the wiper member having a wider lateral edge and a narrower lateral edge and also having a proximal end fixed to the distal end of the shaft and a free distal end, the handle and the wiper member each having a widthwise dimension approximately normal to the shaft and the respective widthwise dimensions of the handle and the wiper member being rotationally offset from each other, the handle and the wiper member each having a thickness substantially less than the widthwise dimension thereof and said thickness being normal to the shaft and to the widthwise dimension, the shaft comprising two parts including joint means rotatably connecting together the two shaft parts at a position between the handle and the wiper member whereby the handle and the wiper member are infinitely rotationally adjustable relative to each other thereby to adjust the rotational offset and further comprising indicia on the two shaft parts for indicating the relative extend of the rotational offset.

5,067,195

DEVICE FOR CLEANING DENTAL IMPLANT POSTS

Harold I. Sussman, 64 Popham Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 302,025, Jan. 25, 1989, Pat. No. 4,941,227. This application Jul. 16, 1990, Ser. No. 553,974
Int. Cl.[5] D46B *9/04*
U.S. Cl. 15—167.001 18 Claims

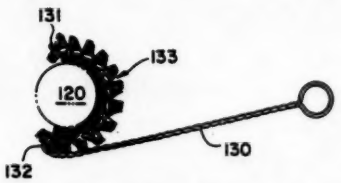
1. A device for cleaning dental implant posts, said cleaning device comprising:

handle means for manually grasping said device; and

brushing means secured to one end portion of said handle means, said brushing means including:

i) a flexible, resilient, spring-like brush member means connected to said one end of said handle means and having a generally semicircular or U-shaped configuration, said generally semicircular or U-shaped configuration defining a receiving space therein for receiving an implant post to be cleaned and resiliently surrounding a major portion of the periphery of the received implant post, said brush member means having first and second free ends at the ends of said generally semicircular or U-shaped configuration which are in opposing and in at least partially facing relation to each other so as to define a gap between said first and second free ends for insertion of an implant post to be cleaned through said gap between said free ends and into said receiving space; and

ii) a plurality of bristles secured to said brush member means, said bristles at least being directed inwardly and downwardly of said generally semicircular or U-shaped configuration, said inwardly directed bristles extending into said receiving space for engaging an implant post received in said receiving space over substantially the complete extent of said generally semicircular or U-shaped configuration so as to simultaneously brush a major portion of the periphery of the received implant post; and said downwardly directed bristles engaging gum tissue adjacent the implant post for keratinizing the outer layer of the engaged tissue;



said flexible, resilient, spring-like brush member means with said plurality of bristles secured thereto being dimensioned so as to be receivable between adjacent teeth at least at the gingival area, and being arranged to brush a dental implant post supporting a tooth at the lingual surface of said post, at the buccal surface of said post, and at the gingival margin adjacent said post, said brush member means and said bristles together engaging around said received post over said major portion of the periphery of said post; said brush member means being resiliently deflectable or spreadable apart when passed between teeth and over a post to engage over said major portion of the received post.

5,067,196

MUD ABSORBENT MAT

Lung-Hsien Chen, 940, Chung Cheng Rd., Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Nov. 15, 1990, Ser. No. 612,986
Int. Cl.[5] A47L *23/22*
U.S. Cl. 15—238 1 Claim

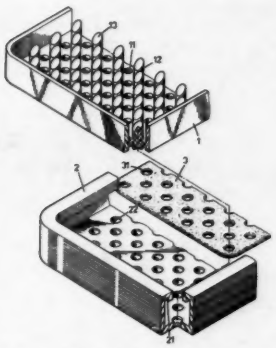
1. An absorbent mud mat comprising:

a plate member having a plurality of holes and scraper members, said plate member having a frame formed about the periphery thereof, said scraper members having inclined upper surfaces, each of said scraper members having a lower section forming a plug member;

an integrally formed base having a plurality of blind holes, each of said blind holes in alignment with and larger than a corresponding one of said plug members, said base having a peripheral rail formed at a top inner edge;

a sponge corresponding in dimensional extent with said plate and having a pattern of holes coinciding with said holes of

said base, said frame of said plate member engaging the rail of said base with said plug members of said scrapers



passing through said holes in said sponge and being inserted into the blind holes of said base.

5,067,197

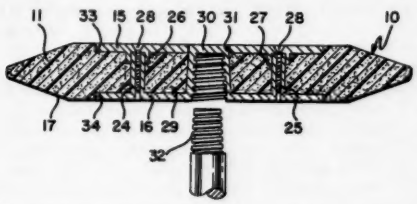
SNOW RAKE

Frederick P. Cormier, 10 Overlook Dr., Spencer, Mass. 01562

Filed Sep. 26, 1990, Ser. No. 588,611

Int. Cl.[5] A47L *13/46*

U.S. Cl. 15—244.1 **8 Claims**



1. A snow rake comprising:

(a) an elongated generally rectangular single, integral main body of resilient low density foamed thermoplastic material, said main body having a broad front surface and broad back surface, and at least one narrow scraping edge, said front surface having a shallow front recess, said back surface having a shallow back recess,

(b) a rigid flat front plate of high density solid thermoplastic material which lies in said front recess,

(c) a rigid flat back plate of high density solid thermoplastic material which lies in said back recess,

(d) an elongated handle which is removably attached to said back plate so that the handle extends substantially at a right angle to said back surface, and

(e) connecting means for fixing said front plate to said back plate so that said main body is clamped between said front and back plates.

5,067,198

WIPER PIVOT

Masaru Ishikawa, and Yuichi Ito, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Kanagawa, Japan

Filed Nov. 9, 1989, Ser. No. 434,960

Claims priority, application Japan, Nov. 11, 1988, 63-147177[U]

Int. Cl.[5] B60S *1/04*

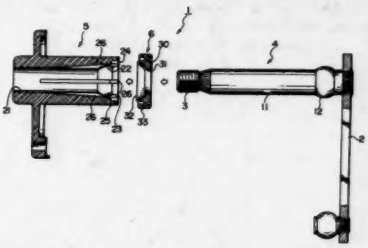
U.S. Cl. 15—250.34 **3 Claims**

1. A wiper pivot for converting reciprocative motion of a connecting rod driven by a drive means into oscillatory motion of a wiper arm, comprising:

a pivot arm;

a pivot shaft connected to said pivot arm at one end thereof and adapted to be connected to the wiper arm at an opposite end thereof for converting said reciprocative motion of the connecting rod connected to said pivot arm into said oscillatory motion of the wiper arm, said pivot shaft being provided with a spherical convex part; and

an elongated pivot holder with a longitudinally extending through hole for rotatably supporting said pivot shaft therein, said pivot holder including a spherical concave part at one end thereof for fitting on the spherical convex



part of said pivot shaft to provide a spherical connection, an annular lip portion extending axially outwardly from said end and having a plurality of cut-out portions adjacent an open end of said spherical concave part in the fitting direction of said pivot shaft and an axially extending annular projection formed radially outwardly but spaced from said lip portion, an annular groove formed therebetween; and

a waterproof member made from elastic material and having a projection fitted into said annular groove of said pivot holder to cover said open end of said pivot holder and prevent outward movemet of said lip portion to retain said spherical convex part of said pivot shaft in said spherical concave part of said pivot holder.

5,067,199

SUCTION DEVICE WITH A SQUEEGEE FOR ELIMINATING DIRTY WATER WHILE CLEANING CERTAIN SURFACES

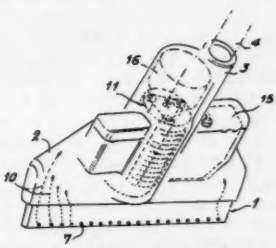
Jean Alazet, 26, rue des Fossés St. Bernard, 75005 Paris, France

Filed Oct. 2, 1990, Ser. No. 592,118

Claims priority, application France, Oct. 13, 1989, 89 13394

Int. Cl.[5] A47L *7/00*

U.S. Cl. 15—320 **5 Claims**



1. A suction device with a squeegee for eliminating dirtied water after the cleaning of certain surfaces, of the type comprising an elastic squeegee as well as suction orifices or ducts for sucking out the cleaning liquid spread on such a surface, by means of a pump connected to a collector tank, wherein:

the cleaning squeegee (**1**, **1***a*, **1***b*, **1***c*) consists in a blade of elastic material within which are formed suction ducts (**5**,

5a, 5b) opening in at least one of the two faces of said squeegee through orifices (7, 7a, 7b) aligned in parallel with the corresponding lowermost edge (8) of said squeegee and in close vicinity to said edge;

the suction ducts (5, 5a, 5b) thus provided are connected with at least one flexible tube (10) leading to a roller-type pump (11) which is further connected to a collector tank (15) for collecting the dirtied cleaning liquid which is to be eliminated.

5,067,200

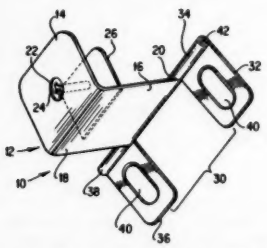
HINGE FOR INSET DOORS

Norman L. Stowell, P.O. Box 1560; Brian D. Stowell, 285 Bonmark Dr., both of Claremont, N.H. 03743, and Gregory T. Stowell, 169 Portsmouth St., No. 6, Concord, N.H. 03301

Filed May 25, 1990, Ser. No. 529,110

Int. Cl.[5] E05D *7/04*

U.S. Cl. 16—237 **8 Claims**



1. A hinge assembly for an inset door which mounts to a sidewall of a door frame and swingably engages the door frame, the inset door having a slot substantially normal to an edge of the door forming a slotted edge and an opening in the back surface of the door communicating with the slot, the hinge assembly comprising;

a door wing having a first leg and a second leg which meet at an intersection forming about a 90° angle, said first leg overlying the back surface of the door and said second leg overlying the edge of the door and extending there beyond;

a second leg knuckle defining an end of said second leg, said second leg knuckle having a second leg passage therethrough, said second leg passage being substantially parallel to said intersection of said first leg and said second leg;

a first leg passage through said first leg;

a fastening means passing through said first leg passage and through the opening in the back surface of the door;

a clamping plate substantially parallel to said first leg engaging said fastening means, said clamping plate being engageable in the slot in the slotted edge of the door;

a split cabinet wing having a first wing tab spaced apart from a second wing tab with said second leg of said door wing fitting therebetween when the door is in a closed position, said first wing tab having a first wing tab knuckle with a first wing tab knuckle passage therethrough and a first elongated wing tab slot substantially normal to said first wing tab knuckle,

and said second wing tab having a second wing tab knuckle with a second wing knuckle passage therethrough and a second elongated wing tab slot substantially normal to said second wing tab knuckle; and

a pin passing through said second leg passage in said second leg knuckle and said first wing tab passage and said second wing tab passage, said first wing tab knuckle passage and said second wing tab knuckle passage being located adjacent to the opposite ends of said second leg passage in said second leg knuckle.

5,067,201

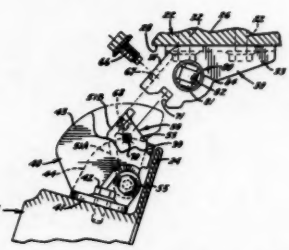
DOOR ON-DOOR OFF VEHICLE HINGE WITH ANTI-SLAP HOLD-OPEN MECHANISM

Joseph H. Marchione, Rockford, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.

Filed Nov. 6, 1989, Ser. No. 432,156

Int. Cl.[5] E05D *7/12*

U.S. Cl. 16—270 **6 Claims**



5. A hinge for mounting a door for swinging between open and closed positions on the body of a vehicle, said hinge comprising a door section, an intermediate section and a body section, means for securing said door section and said body section to the vehicle door and body, respectively, means for pivotally connecting said intermediate section to said door section, said body section and said intermediate sections each having a generally upright web and each having upper and lower vertically spaced and generally horizontal plates, said intermediate section being cradled within said body section with the lower plate of said intermediate section resting on the lower plate of said body section, means for detachably connecting said intermediate section to said body section whereby said intermediate section may be quickly released from and quickly re-attached to said body section to permit the door to be quickly removed from and re-installed on the vehicle body, said last-mentioned means comprising an upright pinon one of the plates of one of said intermediate and body sections, a notch formed in the corresponding plate of the other of said intermediate and body sections and receiving said pin, said notch being generally U-shaped and opening generally horizontally out of said corresponding plate to enable said pin to move generally horizontally into and out of said notch, said pin and said notch coacting with said lower plates to locate said intermediate section relative to said body section, and a threaded fastener extending through said webs to releasably connect said intermediate section to said body section.

5,067,202

METHOD OF MAINTAINING A PREDETERMINED QUANTITY OF SLIVER IN A CARD AND/OR DRAWFRAME

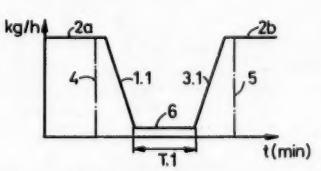
Robert Demuth, Nürensdorf, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jul. 9, 1990, Ser. No. 549,756

Claims priority, application Switzerland, Jul. 26, 1989, 02788/89

Int. Cl.[5] D01G *21/00*

U.S. Cl. 19—65 A **11 Claims**



1. A method of maintaining a predetermined quality of a carded silver produced in a card and/or drafted in a draw-

frame, the sliver being delivered into a can by a sliver delivery device in a continuous spinning mill process, wherein said card and/or drawframe each include a predetermined overproduction relative to a spinning machine associated with the process and a predetermined temporary decrease in production temporarily compensates correspondingly for the overproduction, and wherein the sliver produced during the decrease in production is automatically separated out from the working process.

5,067,203

CARD CLOTHING

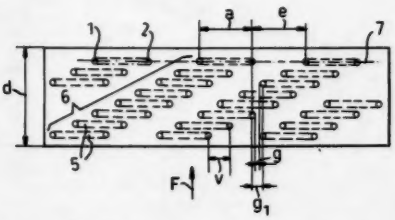
Frank P. Hollmann, Ramsdorf, Fed. Rep. of Germany, assignor to Peter Wolters AG, Rendsburg, Fed. Rep. of Germany

Filed Jul. 27, 1990, Ser. No. 558,862

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1989, 3924890

Int. Cl.[5] D01G *15/84*

U.S. Cl. 19—114 **6 Claims**



1. A card clothing for a yarn carder, comprising:

a card fillet; and

a multiplicity of tooth members set into said card fillet and each being formed with two tooth shanks projecting from said card fillet and formed with a spacing a therebetween and a connecting element interconnecting said shanks and lying transverse to a fiber travel direction upon carding of fiber with the card clothing in said yarn carder,

said tooth members being arrayed with their tooth shanks parallel to one another in a plurality of diagonal groups each consisting of a multiplicity of mutually parallel tooth members staggered transversely to said fiber travel direction and with a constant offset (v) perpendicular to said fiber travel direction between successive tooth members of each group so that corresponding first tooth shanks of said members lie on one side of each group and corresponding second tooth shanks of said members lie on an opposite side of each group, said first tooth shanks of a group being offset transverse to said fiber travel direction relative to successive first tooth shanks of the same group in said fiber travel direction by said constant offset (v),

said groups being inclined to said fiber travel direction and at least partly overlapping neighboring ones of said groups is said fiber travel direction, neighboring groups being spaced from one another at a spacing e equal to said spacing a, said tooth members of said groups lying in respective tooth rows perpendicular to said fiber travel direction, for an even number of said tooth rows and a correspondingly odd number of offsets of tooth members between the tooth rows of the even number, a first or second tooth shank of a leading tooth member of each of said groups with respect to said fiber travel direction being in line in said fiber travel direction only with a respective first or second tooth shank of a trailing member of said even number of tooth rows of a neighboring group and with no other tooth shank within said even number of tooth rows.

5,067,204

METHOD FOR CONTINUOUSLY SUPPLYING SLIVERS TO A ROVING FRAME

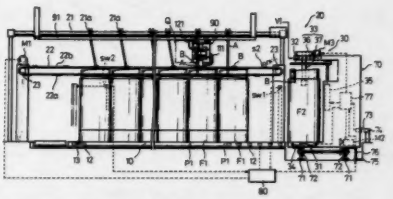
Kunio Shinkai, Handa; Toyoo Suzuki, Nishio; Yukitaka Nomura, Gifu; Yoshio Kurachi, Nishikasugai, and Hiroyuki Kureishi, Nagoya, all of Japan, assignors to Howa Machinery Ltd., Japan

Filed Mar. 20, 1990, Ser. No. 495,912

Claims priority, application Japan, Mar. 23, 1989, 1-71310

Int. Cl.[5] D01H *9/18*; B65H *67/08*

U.S. Cl. 19—159 A **4 Claims**



1. An improved method of continuously supplying slivers to a roving frame provided with a plurality of drafting units, including an automatic piecing operation of a sliver coming from a sliver supply can with a corresponding free end of a sliver from a full packaged sliver can, wherein a plurality of sliver cans are arranged in each of a plurality of spaces formed along a longitudinal direction of said roving frame in parallel to each other, while said slivers are supplied from respective sliver cans to the corresponding drafting units of said roving frame, in a supply condition such that the arrangement of said sliver cans between said spaces with respect to the volume of sliver contained therein is maintained in a tapered condition, comprising,

forming each one of said spaces as a pair of parallel units spaces, each of said unit spaces being capable of arranging an alignment of said sliver cans for supplying sliver to a corresponding one of said drafting units, and said full packaged sliver cans,

mechanically arranging full packaged sliver cans in either one of said unit spaces of a particular one of said spaces, wherein said supply sliver cans for supplying sliver to said roving frame, are arranged in another unit space thereof and contain a smallest volume of sliver in comparison with other sliver cans arranged in said spaces, except for said particular spaces, by regulating a standby position of each of said full packaged sliver cans at a position facing the corresponding one of said sliver supplying cans,

regulating an angular position of said free end of sliver from each one of said full packaged sliver cans with respect to a longitudinal axis of said full packaged sliver can at a predetermined angular position when said full packaged sliver cans are arranged in said unit space of said particular space,

mechanically piecing said free ends of said supplied slivers with corresponding free ends of slivers from said full packaged sliver cans arranged at said standby positions facing corresponding said sliver cans in an exhausted condition, with respect to sliver supply cans of said particular space,

carrying out said unit sliver piecing operation for all sliver supplying cans in an identical alignment under a condition of mixing slivers of free end portions of both said slivers,

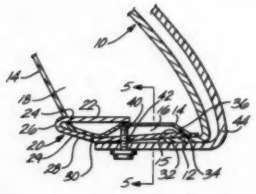
thereafter discharging said sliver cans at which said sliver end piecing operation is completed from said unit space of said particular space,

applying said unit operation composed of said sliver piecing operation and discharging operation of sliver supply cans in an exhausted condition to all of said sliver supply cans at other spaces according to a consumption of sliver in each sliver supply cans, one space by one space, of said space arrangement.

5,067,205
STRUCTURE OF PAPER CLIP
Chun-Hui Chen, No. 132-3, Tu-Cheng Rd., Chin-Cheng Tsun, Ta-Li Hsiang, Taichung Hsien, and Guu-Trang Lin, No. 198, Sec. 3, Ching-Tao Rd., Taichung, Taichung, both of Taiwan
Filed Sep. 27, 1990, Ser. No. 588,727
Int. Cl.[5] B42F 1/02
U.S. Cl. 24—67.9 4 Claims

1. A paper clip including a front end and a back end, the clip being formed of resilient steel wire bent to define first and second bend portions extending in the same direction toward the front end for clamping paper therebetween, the first and second bend portions being collectively disposed in a first single plane, a third bend portion joining the first and second bend portions at the back end, the third bend portions being of a wave configuration defined by at least one peak portion and one trough portion, the third bend portion being disposed in a second single plane perpendicular to the first single plane, whereby the third bend permits the first and second bend portions to securely clamp a pile of paper sheets therebetween such that each of the first and second bend portions substantially entirely engages the top and bottom surfaces of the stack.

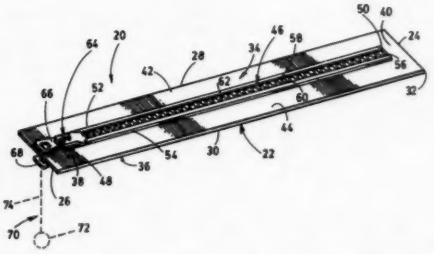
5,067,206
FASTENER FOR VEHICLES
William M. Metcalfe, 93 Prince Alfred Parade, Newport 2106, NSW, Australia
Filed Jun. 25, 1990, Ser. No. 543,219
Int. Cl.[5] B60R 13/04
U.S. Cl. 24—290 22 Claims



1. A fastener for attaching a device to a vehicle body, the body having surfaces which define a recess and which define an oppositely facing land, the fastener comprising:
a bracket having a hook for engaging the land and a bar for extending from the hook over the recess;
a pin for engaging the bar and extending from the bar into the recess to secure the hook in engagement with the land; and
means for attaching the device to the fastener.

5,067,207
ZIPPER ATTACHMENT ASSEMBLY
William Semons, 14 Highland Ave., Salem, Mass. 01970
Filed Aug. 7, 1990, Ser. No. 563,349
Int. Cl.[5] A44B 19/00
U.S. Cl. 24—381 6 Claims

1. A unitary zipper attachment assembly comprising:
A) a monolithic one-piece base having two outside end edges, two outside side edges, a front surface and a back surface;
B) a zipper mechanism mounted on said base front surface adjacent to and spaced from both of said outside side edges and adjacent to and spaced from both of said outside end edges to be completely surrounded by said base, said base having a monolithic border completely surrounding said zipper mechanism, said zipper mechanism having a first end located adjacent to and spaced from a first outside end edge of said base end edges, a second end located adjacent to and spaced from a second outside end edge of said base end edges, a first side located adjacent to and spaced from one outside side edge of said base side edges, a second side located adjacent to and spaced from a second outside side edge of said base side edges, a first end piece on said zipper mechanism first end, and a second end piece on said zipper mechanism second end;

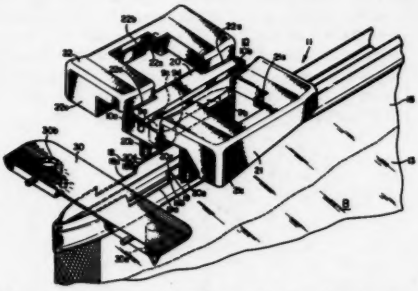


C) zipper side elements attaching said zipper mechanism to said base front surface and spacing said zipper mechanism from said base;
D) adhesive material on said base back surface and covering essentially the entire base back surface;
E) a monolithic, uninterrupted one-piece protective cover releasably attached to said base back surface via said adhesive material to cover essentially the entire base back surface; and
F) an opening defined through said base beneath said zipper mechanism, said opening including a first end located adjacent to said zipper mechanism first end, a second end located adjacent to said zipper mechanism second end, said border completely surrounding said opening on all peripheral locations of said opening.

5,067,208
PLASTIC RECLOSABLE FASTENER WITH SELF-LOCKING SLIDER
F. John Herrington, Jr., Holcomb, and Eric A. St. Phillips, Fairport, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Mar. 22, 1991, Ser. No. 673,707
Int. Cl.[5] A44B 19/16
U.S. Cl. 24—400 6 Claims

1. A plastic reclosable fastener with self-locking slider particularly suited for plastic bags and the like for closing or opening the reclosable fastener, said reclosable fastener comprising a pair of flexible plastic strips having separable fastener means extending along the length thereof comprising reclosable interlocking male and female profile elements on the respective strips, said strips including profiled tracks extending along the length thereof parallel to said male and female elements, said slider having a separator finger and interlocking complementary structure formed from plastic for moving along the fastener in straddling relation, the complementary structure comprising a transfer support member having said separator finger depending therefrom, said support member being positioned on the top edges of said tracks with said separator finger inserted therebetween, a pair of side walls on the opposite sides of said support member for receiving said

pair of strips therebetween, said separator finger and said side walls extending from an opening end of the slider to a closing end, said separator finger being wider at said opening end of said slider than at the closing end of said slider, the side walls being spaced wider apart at the opening end to permit separation of the male and female elements by the wider end of said separator finger extending between the side walls at the opening end, the side walls being spaced sufficiently close together at closing end to press the male and female elements into interlocking relationship as the slider is moved in a fastener closing direction, and means for restraining said slider in closed position and maintaining said male and female elements in interlocking relation when said slider reaches the closed end of its travel along said tracks comprising a protrusion on said wider end of said separator finger adjacent said opening end of said slider and notch structure at the adjacent end of said tracks, said notch structure having an end located on said tracks to permit said wider end of said separator finger to move beyond said end from between said tracks and into said notch structure, said protrusion being engageable with the end of said notch structure when said slider is at the closed end of its travel on said tracks thereby restraining said wider end of said separator finger from moving out of said notch structure and between said tracks and inadvertently opening said male and female elements of said fastener.



5,067,209

SLIDE FASTENER SLIDER

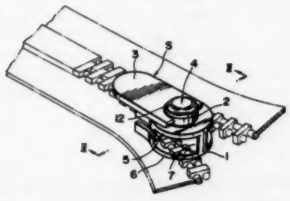
Yasuharu Terada, Uozu; Susumu Ishii, Kurobe, and Hiroshi Mizuno, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 594,697

Claims priority, application Japan, Oct. 17, 1989, 1-121345[U]

Int. Cl.[5] A44B *19/26*

U.S. Cl. 24—429 **7 Claims**



1. A slide fastener slider comprising:

(a) a slider body including a pair of spaced upper and lower wings connected at their front end by a guide post, said slider body having a mounting hole extending through the thickness of said upper wing and said lower wing;

(b) a circular disk having a central guide hole and disposed on said upper wing with said guide hole aligned with said mounting hole, wherein said mounting hole further extends through said guide post;

(c) a pull tab pivotally connected to said circular disk; and

(d) a retainer pin having an enlarged head and a shank extending centrally from one side of said head, said head having a diameter substantially the same as the outside diameter of said circular disk, said shank extending loosely through said guide hole and firmly fitted in said mounting hole to join said retainer pin with said slider body while allowing said circular disk to rotate freely about said shank.

5,067,210

SURFACE-TYPE FASTENER

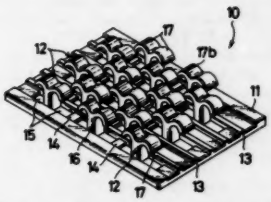
Keiichi Kyaki, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 592,126

Claims priority, application Japan, Oct. 3, 1989, 1-116535

Int. Cl.[5] A44B *13/00*

U.S. Cl. 24—452 **5 Claims**



1. A surface-type fastener comprising a pair of base strips each having longitudinal ridges and transverse ribs defining therebetween elongate apertures and a plurality of rows of interengaging elements, said apertures extending through said base strips, said interengaging elements each having a stem portion extending substantially vertically upward from said longitudinal ridges, and a hookable engaging arm which is substantially as large as said aperture, and said interengaging elements in one row being offset in position with respect to those elements in the next adjoining row, and spaced-apart longitudinally to provide an engaging space in which said arms of said base strips can be resiliently engaged with one another when said base strips are pressed together.

5,067,211

BELT LOCK FOR BELT STRAP RETAINING SYSTEMS

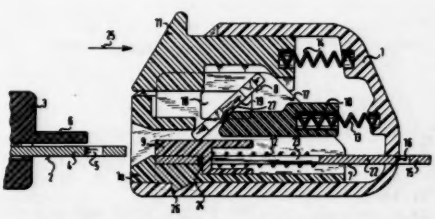
Reiner van Riesen, Besenheide 36, 2200 Elmshorn, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 542,301

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1989, 3920565

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—641 **7 Claims**



1. A belt lock for a belt strap retaining system, comprising:

a belt strap end piece having a locking tongue and a control member,

a closure mechanism arranged and constructed to receive said tongue and said control member,

a V-shaped metal frame having elongated lateral guide re-

cesses, said lateral recesses extending in a direction substantially parallel with an insertion path and being arranged and constructed to guide said pins in a parallel direction without vertical play,

a substantially flat plate locking member mounted in said frame, said locking member engageable by said control member to lock said tongue in said frame,

pins disposed in said recesses, said pins arranged and constructed to mount said locking member in said frame,

a spring loaded ejector arranged and constructed to eject said tongue from said closure mechanism,

a spring loaded locking member support movable in a direction substantially parallel with an insertion path, said locking member support arranged and constructed to secure said locking member in a tongue locking position, said locking member support disposed behind said locking member, above said ejector,

a spring loaded release button arranged and constructed to move said locking member to a tongue releasing position,

a cross piece disposed on said frame,

a first stop disposed on said cross piece, said first stop arranged and constructed to stop and lock said locking member in a locking position, and

a second stop disposed at an upper region of said locking member, said second stop arranged and constructed to engage said release button and move said locking member to said releasing position.

5,067,212

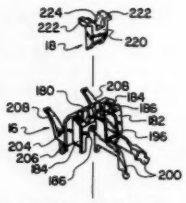
SEAT BELT BUCKLE

Robert P. Ellis, Rochester, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Aug. 27, 1990, Ser. No. 573,877

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—642 **20 Claims**



1. A buckle for a seat belt locking tongue, said buckle comprising:

a pushbutton member supported for movement along an axis; and

an ejector member supported for movement along said axis, said ejector member having an ejector surface for engaging and moving the tongue, an upper horizontal surface, a lower horizontal surface spaced vertically from said upper horizontal surface a distance approximately equal to the thickness of the tongue, and a contact surface for engaging and moving said pushbutton member, said contact surface being located entirely between said upper and lower horizontal surfaces.

5,067,213

SWIMMING POOL ANCHOR AND REMOVAL TOOL

Kelly J. Ragsdale, Salt Lake City, and Cory Brady, West Jordan, both of Utah, assignors to Cover-Pools, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 377,235, Jul. 7, 1989, Pat. No. 4,953,269. This application Sep. 4, 1990, Ser. No. 577,944

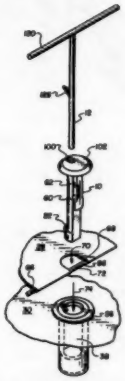
Int. Cl.[5] F16B *21/00;* **B25B** *13/06*

U.S. Cl. 24—704.1 **3 Claims**

1. In combination, a fastener for use in releasably securing a first member defining an aperture therethrough and a second member defining a receiving aperture therethrough and a removal tool for removing from fastener from said first member aperture said second member aperture; said fastener comprising:

a first shaft having two longitudinally-extending legs, said legs being positioned spatially apart from one another to define a laterally-extending first channel therebetween; a first said leg having a lip on a free end thereof; said first shaft defining a pair of longitudinally-extending open second channels configured in an exterior sidewall of said first shaft, said second channels communicating with said first channel said first channel and said second channels being dimensioned to receive a cord mounted on said first member proximate said aperture in said first member;

a head mounted on said first shaft, said head defining a slot therein, wherein said shaft defines a third longitudinal open channel in said exterior sidewall; said shaft further defining an open, laterally-extending fourth channel in said exterior sidewall, said fourth channel being an interface of said head and said shaft; said fourth channel communicating with said slot and said third channel;



wherein said fastener is adapted to engage said first member cord in said first and second channels and be insert through said apertures of said first and second members, said lip engageable with said second member to retain said fastener and cord within said second member aperture and said removal tool comprising:

a handle;

a second shaft mounted on said handle, said second shaft being dimensioned to be inserted through said slot in said head and thereafter be received in said third longitudinal channel; and

an extension mounted on said second shaft to extend laterally therefrom said exterior being dimensioned to be received through said slot and upon a rotation of said second shaft be received in said fourth channel;

said tool being adaptable for use in applying a disengaging force against said fastener from its engagement with said second member.

5,067,214

TENTER FRAME APPARATUS AND METHOD

Christopher E. Hosmer, Taylors, S.C., and John F. Whaley, Warwick, R.I., assignors to Marshall and Williams Company, Providence, R.I.

Continuation-in-part of Ser. No. 244,300, Sep. 15, 1988, Pat. No. 4,926,529. This application May 22, 1990, Ser. No. 527,015

Int. Cl.[5] D06C *3/04*

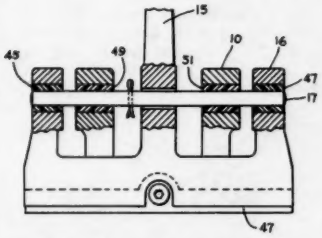
U.S. Cl. 26—89 **1 Claim**

1. A lubrication free tenter clip having a supporting member for processing sheet material comprising:

mold bushings constructed of low friction wear resistant

polyimide resin press fitted into a bore defined by a supporting member;

said bushings having been axially bored while press fitted to



increase the size of an opening in said bushings to accommodate a pin and minimize the thickness of he bushings; whereby breakage of he bushings during boring is avoided while the bushing thickness is minimal.

5,067,215

AUTOMATIC ADJUSTING SELVEDGE CONTROL DEVICE FOR A TEXTILE WEB USING MULTIPLE SENSORS

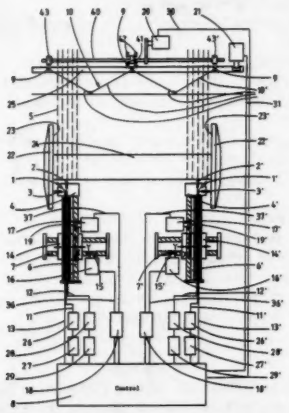
Klaus Behl, Neumunster; Karl-Heinz Erren, Aukrug-Homfeld, and Ekkehard Mantz, Gross-Kummerfeld, all of Fed. Rep. of Germany, assignors to Norddeutsche Faserwerke GmbH, Neumunster, Fed. Rep. of Germany

Filed Sep. 10, 1990, Ser. No. 579,951

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1989, 3931066

Int. Cl.[5] D02H *13/16*

U.S. Cl. 28—190 **5 Claims**



1. A device for controlling the take up of yarn on a beam with a movable reed, and comprising

at least one sensor head mounted on a holding device, said sensor head having a first, a second and a third sensor with each connected by an electrical line to a programmable control means,

said second and third sensors extending at an angle of 90° with respect to each other and said first sensor extending at an angle of 45° with respect to both said second and third sensors,

said holding device being carried on support means for moving said holding device along a first and a second axis which extend perpendicularly to one another, said support means including first and second motor means each for effecting movement along one of said axes of said holding device, said motor means being connected to and operated by said control means,

a first reed moving motor for moving said movable reed parallel to said beam and a second reed motor for adjusting the lap width of said movable reed, said reed motors each being connected to and controlled by said control means.

5,067,216

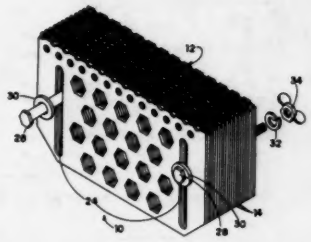
ADJUSTABLE LINE BLOCK FOR AUTOBODIES

Kevin D. Hargraves, 1102 - 606 Victoria Avenue, Saskatoon, Saskatchewan, Canada S7N 0Z1

Filed Dec. 6, 1989, Ser. No. 446,619

Int. Cl.[5] B23D *71/08*

U.S. Cl. 29—79 **8 Claims**



1. An adjustable line block for finishing a profiled surface of a workpiece, said line block comprising:

a plurality of stacked plates each having an elongate cutting edge;

a plurality of notches uniformly spaced along the cutting edge of each plate;

a plurality of symmetrical cutting teeth formed in the cutting edge of each plate between each two adjacent notches, the teeth of each plate being aligned along the cutting edge for simultaneous engagement of the teeth with the profiled surface;

means for holding the plates together with their cutting edges parallel and with adjacent notches in the cutting edges of adjacent plates offset from one another in the direction of the cutting edges, while permitting relative movement of the plates transversely of the cutting edge; and

means for clamping the plates together to prevent relative movement thereof.

5,067,217

SPIRAL SHRINK BELT AND A PERFORATED ROLL

Michael Maguire, Waycross, Ga., assignor to Scapa, Inc., Waycross, Ga.

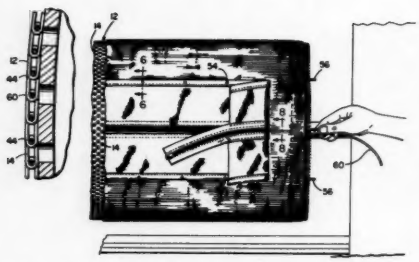
Filed Dec. 6, 1990, Ser. No. 622,967

Int. Cl.[5] B21B *27/03*

U.S. Cl. 29—121.3 **3 Claims**

1. In combination, a spiral fabric shrink belt and a perforated roll, said spiral fabric shrink belt being mounted directly on and about a periphery of said perforated roll and said spiral fabric shrink belt having two ends, said two ends being interengaged and forming a channel between interdigitated coils

located at said two ends as present in spiral fabric, and a joining wire extending through the channel to secure said two ends



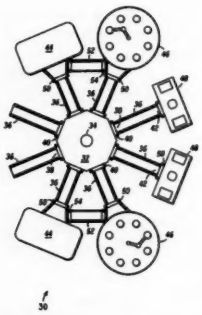
together of said spiral fabric shrink belt around said perforated roll.

5,067,218

VACUUM WAFER TRANSPORT AND PROCESSING SYSTEM AND METHOD USING A PLURALITY OF WAFER TRANSPORT ARMS

Owen P. Williams, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1990, Ser. No. 526,255
Int. Cl.[5] H01L *21/30, 21/46, 21/50;* **C23C** *14/56*
U.S. Cl. 29—25.01 **21 Claims**



f
30

1. A vacuum wafer transport and processing system comprising:

a central vacumm chamber;

wafer holding means disposes in said central vacuum chamber;

a plurality of wafer transport arms to transfer wafers to and from said central vacuum chamber, each having a first end coupled to said central vacuum chamber and a second end; and

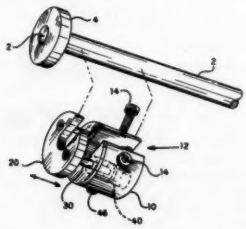
a plurality of wafer process chambers coupled to said second ends of at least some of said plurality of wafer transport arms.

5,067,219

FAN BLADE REMOVER

Peter F. Ulmer, P.O. Box 435, Empire, La. 70050

Filed Oct. 22, 1990, Ser. No. 603,959
Int. Cl.[5] E21B *19/00*
U.S. Cl. 29—252 **14 Claims**



1. A remover for removing a hub from a shaft by exerting a repulsive force between said shaft and said hub thereupon, comprising:

a body;

a groove extending through said body, said groove defining a U-shaped groove outline and including a substantially straight bottom, said groove adapted to accept said shaft within said bottom of said groove;

clamping means for preventing relative motion of said body and said shaft when said shaft lies in said bottom of said groove;

a generally planar plate slidably attached to said body, and adapted to move relative to said body in a direction parallel to said bottom of said groove.

said plate generally perpendicular to said bottom of said groove;

an indentation in said plate defining a U-shaped indentation outline congruent with said groove outline to pass said shaft therethrough when said shaft lies in said bottom of said groove; and

force means for exerting said repulsive force between said body and said plate to remove said plate in said direction parallel to said bottom of said groove away from said body,

said force means symmetrically disposed about said shaft;

whereby, said shaft may be laterally inserted into said groove and when said shaft lies in said bottom of said groove and said clamping means are engaged, said plate may exert said repulsive force on said hub, and said hub may be moved relative to said shaft.

5,067,220

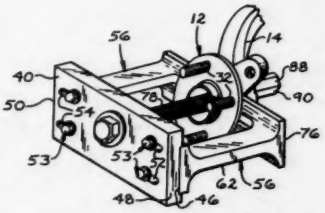
FRONT WHEEL DRIVE HUB PULLER

Todd M. Combs, Jackson; Gary K. Deraedt, Rives Junction, and Duane A. Goodrich, Battle Creek, all of Mich., assignors to Dowley Manufacturing, Inc., Spring Arbor, Mich.

Filed Dec. 11, 1990, Ser. No. 625,416
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—259 **3 Claims**

1. A hub puller for removing hubs from the bearing of front wheel drive vehicles having a knuckle housing wherein the housing includes a bearing having an axis and an exterior outwardly facing shoulder surface transversely disposed to the bearing axis adjacent a knuckle housing cylindrical surface concentric to the bearing axis, and an annular hub press fitted into the bearing having an inner end, in combination an elongated yoke having a central region and first and second sides, a pair of compression resistant arms extending from said first yoke side, each of said arms having a free end, a head defined

on each arm free end, an abutment surface defined upon each arm head facing away from said yoke adapted to engage the knuckle housing shoulder surface, a concave cylindrical surface defined upon each arm head adapted to engage the knuckle housing cylindrical surface when the arms' abutment surface engages the housing shoulder, a threaded shaft having



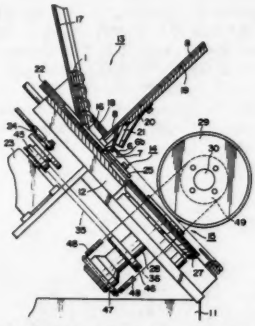
an inner end extending between said arm heads and an outer end extending through said yoke central region, an adapter mounted on said shaft inner end adapted to engage the hub inner end, and threaded drive means associated with said shaft and yoke for axially displacing said shaft through said yoke and the hub toward said yoke.

5,067,221

METHOD OF AND APPARATUS FOR ASSEMBLING SLIDE FASTENER SLIDERS

Yoshio Oyama, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 19, 1991, Ser. No. 687,628
Claims priority, application Japan, Apr. 20, 1990, 2-106270
Int. Cl.[5] E21D *53/54*; A41H *37/06*
U.S. Cl. 29—409 **8 Claims**



1. A method of assembling a slide fastener slider by fitting together a slider body having an attachment lug provided on the upper surface thereof and a pull tab having an aperture in one end thereof, there being a large enough gap between a distal end of the attachment lug and the upper surface of the slider body to allow the distal end to pass through the aperture of the pull tab, the method comprising the steps of:

(a) transporting the slider body along a transport path continuously with the distal end of the attachment lug directed forward;

(b) placing a pull tab on the transport path with the aperture disposed in registry with the path of the distal end to cause the distal end of the attachment lug to catch the aperture of the pull tab while the slider body is transported along the transport path; and

(c) gradually pressing the distal end of the attachment lug toward the slider body as the slider body is transported along the transport path, so as to join the pull tab to the slider body.

3. An apparatus for assembling a slide fastener slider by fitting together a slider body having an attachment lug provided on the upper surface thereof and a pull tab having an aperture in the one end thereof, there being a large enough gap between a distal end of the attachment lug and the upper surface of the slider body to allow the distal end to pass through the aperture of the pull tab, the apparatus comprising:

(a) a base;

(b) a transport channel provided on the base to transport the slider body along a transport path;

(c) a first chute communicating with the transport channel adjacent its one end for feeding the slider body into the transport channel with the distal end of the attachment lug directed forward;

(d) a second chute communicating with the transport channel downstream of the first chute for feeding the pull tab to the transport channel and placing the pull tab thereon with the aperture thereof in registry with the path of the distal end of the attachment lug;

(e) a pusher mounted reciprocally movable on and along the transport channel beyond the second chute to cause the distal end of the attachment lug to catch the aperture of the pull tab;

(f) means disposed downstream of the second chute and driven for continuous rotation for transporting the slider body thereon continuously and constituting a die; and

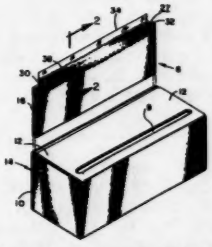
(g) a punch roller rotatably mounted on a horizontal axle provided over the transporting-and-die-constituting means and disposed normal to the transport channel to gradually press the distal end of the attachment lug toward the transporting-and-die-constituting means.

5,067,222

METHOD OF MANUFACTURING A GUARDED CUTTING EDGE FOR A WRAPPING MATERIAL DISPENSER

Armin C. Frank, Philadelphia, and Harry E. Sulzer, Perkasie, both of Pa., assignors to Mef Co., Inc., North Wales, Pa.

Filed Sep. 5, 1990, Ser. No. 577,932
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—411 **7 Claims**



6. The method of claim **5** wherein said feed of the subassembly into said assembly station is controlled to position the leading end of said subassembly at a predetermined point relative to leading edge of the container board stack.

5,067,223

METHOD FOR DETACHING A HYPODERMIC NEEDLE THREADABLY ENGAGED TO A SYRINGE

John Bruno, 77-83 Second Ave., Paterson, N.J. 07514

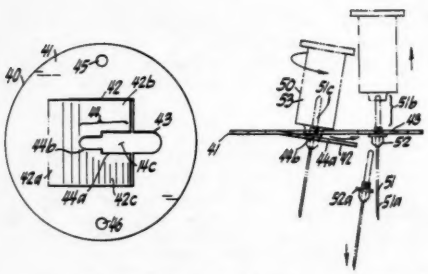
Division of Ser. No. 423,977, Oct. 19, 1989. This application Dec. 14, 1990, Ser. No. 627,319
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—426.5 **5 Claims**

1. A method for detaching a hypodermic needle threadably engaged to a syringe body via a needle hub member, and safely storing the detached needle for disposal, comprising the steps of:

inserting the needle into a first needle receiving slot formed in a needle removal device affixed to a container providing first entry means in communication with said needle removal device;

engaging said needle hub member with said needle removal device by slidably translating said needle hub member through said first receiving slot into a needle engaging slot formed contiguously with said first needle receiving slot;

rotating the syringe body to threadably detach the syringe body from the needle; and



removing the detached needle and syringe body from said needle engaging slot and slidably translating them back through said first needle receiving slot into a second needle receiving slot formed in said needle removal device at a generally higher elevation with respect to said first needle receiving slot to position the needle hub member on the underside of the needle removal device and permit the needle to drop into said container through said first entry means.

5,067,224

METHOD OF INSTALLING SELF-ATTACHING FASTENER AND APPARATUS

R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 196,209, May 19, 1988, Pat. No. 4,915,558, which is a division of Ser. No. 892,017, Aug. 1, 1986, Pat. No. 4,765,057, which is a division of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, said Ser. No. 504,074, is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 485,099, is a division of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Feb. 26, 1990, Ser. No. 485,340

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

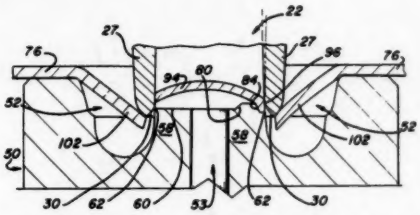
Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—432.2 **13 Claims**

1. A method of attaching a self-piercing and riveting fastener to a panel, said fastener including an annular barrel portion having barrel side walls which define an opening into said barrel and a piercing surface adjacent said opening, said method comprising the following steps:

(a) driving said barrel piercing surface against said panel, thereby piercing a slug from said panel, and forming an opening through said panel;

(b) driving said barrel piercing surface through said panel



opening and deforming said barrel side walls adjacent said opening radially outwardly, thereby riveting said barrel portion to said panel; and

(c) driving said panel slug into said barrel portion through said barrel opening and staking said slug against said barrel side walls, said stalking thereby lodging said slug against said barrel side walls.

5,067,225

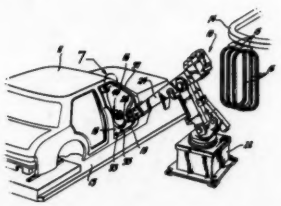
METHOD OF A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

Stephen St. Angelo, Jr., Rochester Hills; John J. Lucci, Lansing, both of Mich.; George C. Carver, Albany, Ga.; Alan Heads, New Market, and James F. Mitchell, Oshawa, both of Canada, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 285,989, Dec. 19, 1988, abandoned. This application Mar. 7, 1991, Ser. No. 666,176

Int. Cl.[5] B23P *21/00;* **B23Q** *15/00*

U.S. Cl. 29—451 **2 Claims**



1. A method for utilizing a robot with an arm having an idler roller for supporting a fixed length of weather stripping, a guide roller having a first position for engagement with said fixed length of weather stripping opposite said idler roller and a second position for nonengagement with said fixed length of weather stripping, a fork and a pressure roller to install said fixed length of weather stripping into a body opening, said method in combination including:

bracketing said fixed length by surrounding said fixed length with said fork;

engaging said fixed length with said guide roller opposite said pressure roller thereby aligning said fixed length with said pressure roller; and

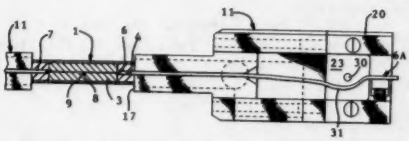
interacting said pressure roller with said opening whereby said fixed length is guided and affixed with said opening of said body.

5,067,226

METHOD OF ASSEMBLING AN OPTICAL FIBER BY APPLYING PRESSURE TO ABUTTING OPTICAL FACES

Walter A. Egner, Oberlin; Ronald R. Schaffer, Harrisburg; Larry R. Stauffer, Camp Hill, and Gary N. Warner, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 209,257, Jun. 20, 1988, Pat. No. 4,907,335.
This application Mar. 17, 1989, Ser. No. 324,944
Int. Cl.[5] B23P *19/04*; G02B *6/38*
U.S. Cl. 29—452 5 Claims



1. A method for assembling an optical fiber in a passage of a connector by applying axial force to the fiber to maintain an optical face of the fiber in abutment with an optical face of an optical device mounted to the connector, the method comprising the steps of:

holding the fiber with a tool separate from the connector while the tool applies a bend in the fiber to reduce resistance of the fiber to buckling under pressure,

inserting the fiber into the passage of the connector while holding the bend of the fiber by the tool,

applying axial force to the fiber without restricting bending of the fiber in the tool to apply pressure between abutting optical faces of the fiber and the device, and

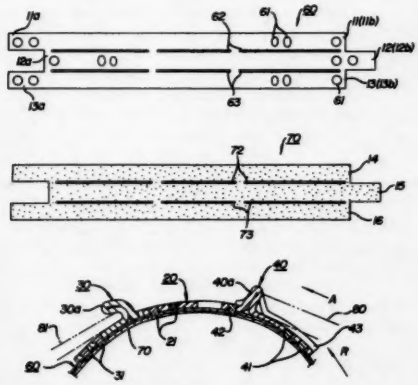
securing the fiber to the connector to maintain the pressure between the abutting optical faces.

5,067,227

DOUBLE WRAP BRAKE BAND AND ITS MANUFACTURING METHOD

Teruhiko Tanaka, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 402,411, Sep. 5, 1989, Pat. No. 5,012,905.
This application Oct. 1, 1990, Ser. No. 590,867
Claims priority, application Japan, Sep. 12, 1988, 63-227680
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—469 3 Claims



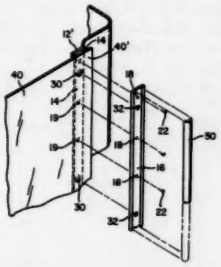
1. A method for manufacturing a double wrap brake band comprising the steps of forming a sheet metal strap having rivet holes at the opposite ends thereof for securing brackets thereto and slit groups in two parallel rows extending intermittently in a longitudinal direction of said strap into a substantially perfect annular shape by bending said strap; fastening a band-shaped friction facing having extending groups of slits corresponding in length and number to said slits in said metal strap to the inner annular surface of said strap, said slits in said strap and friction facing dividing said strap, with said friction facing thereon, into three annular bands, one band at each of the opposite outer side portions of said annular shaped strap outwardly of said two parallel rows of slits and one intermediate annular band intermediate said two parallel rows and outer bands, said two outer bands and said intermediate band each having said rivet holes at the opposite ends thereof; forming first and second sheet metal brackets having outwardly extending edge portions, said edge portion of one of said brackets being formed for receiving a piston and said edge portion of the other of said brackets being formed for receiving an anchor pin connected to said piston, said first and second sheet metal brackets having rivet holes extending therethrough for alignment with said rivet holes on said outer bands and said intermediate band, respectively, one of said sheet metal brackets for riveting to said intermediate band having wing-shaped reinforcing members extending outwardly from opposite sides of said one bracket for covering portions of said outside bands when the other of said brackets is secured to said outside bands and said one bracket is secured to said intermediate band; and securing said one of said brackets to said intermediate band and said other of said brackets to said outside bands by inserting rivets in said rivet holes in said one bracket and said intermediate band and through said rivet holes in said other of said brackets and said outer bands and caulking said rivets in said holes.

5,067,228

APPARATUS AND METHOD FOR BLIND ATTACHMENT OF A LINER TO A POOL SUPPORT STRUCTURE

John Gardenier, Guilderland, N.Y., assignor to Saratoga Spa & Bath Co., Latham, N.Y.

Filed May 9, 1990, Ser. No. 521,335
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 29—525.1 9 Claims



1. In a water containment structure including a preformed structural module, a membranous liner and faceplate sealing means for fixed securing of the liner to a protruding flat margin of the module in a water-tight configuration, an improvement for effecting a blind overlay installation of the faceplate sealing means so that it secures integrally the liner in said configuration, said improvement comprising a flat template strip having at least one detent-in-receptacle indexing pair means that is associated with an index compliment pair means disposed on the margin of the module; and fixing means for fixing said indexing pair means to said index compliment pair means with the liner secured therebetween.

5,067,229

CUTTING DEVICE FOR USE IN MANUFACTURING ELECTRONIC COMPONENTS

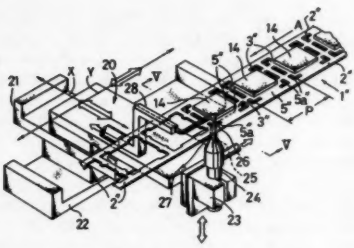
Nobuyuki Nakamura; Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Division of Ser. No. 488,129, Mar. 5, 1990. This application Oct. 22, 1990, Ser. No. 601,934

Claims priority, application Japan, Mar. 7, 1989, 1-26342[U]

Int. Cl.[5] B23P *23/00*

U.S. Cl. 29—566.1 **4 Claims**



1. A cutting device for use in manufacturing electronic components from a board supply frame which comprises a parallel pair of elongate side bands, said board supply frame further comprising a plurality of unit circuit boards integrally incorporated in said frame by means of connecting webs and arranged between said pair of side bands at a predetermined interval therealong, said cutting device comprising:

an X-Y table arranged in a path of transfer of said frame, said table having a supporting portion which is reciprocally movable in an X-Y plane along an X-axis as well as along a Y-axis perpendicular to said X-axis, said plane being parallel to another plane containing said frame; and

a spindle rotatably supported at said supporting portion of said X-Y table to extend toward said frame, said spindle having a front end provided with a rotary cutting or grinding element for severing said connecting webs of said frame.

5,067,230

METHOD FOR THE MANUFACTURE OF PLANAR MAGNETIC HEADS BY MAKING CAVITIES IN A NON-MAGNETIC WAFER

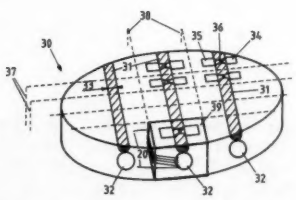
Paul-Louis Meunier, Paris; Jean-Marc Coutellier, Maurepas, and Jean-Claude Lehureau, Sainte Genevieve Des Bots, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Jun. 21, 1990, Ser. No. 541,331

Claims priority, application France, Jul. 4, 1989, 89 08962

Int. Cl.[5] G11B *5/42*

U.S. Cl. 29—603 **20 Claims**



1. A method for manufacturing magnetic heads with planar structure used for the encoding and reading of magnetic tapes, each of said magnetic heads having a microgap formed between two magnetic poles and facing a gap defined between two wire-wound ferrite cores, comprising the steps of:

depositing said magnetic poles as thin layers on a first face of a wafer of non-magnetic material; and

hollowing out, in an opposing face of said water, at least one housing cavity in which said wire-wound cores are disposed, said cores being disposed on a second wafer, so as to obtain a calibrated spacing or a junction between an upper part of said wire-wound cores and said thin layer magnetic poles.

5,067,231

SYSTEM FOR PRESS-FITTING PARTS INTO WORKPIECE

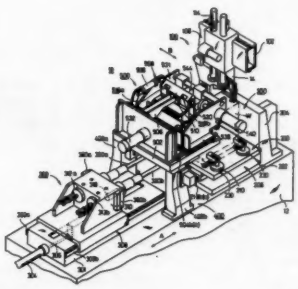
Tsugio Ueno; Masato Sato, and Yoshiaki Mori, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1990, Ser. No. 510,451

Claims priority, application Japan, Apr. 17, 1989, 1-96759; Apr. 17, 1989, 1-96760; Apr. 17, 1989, 1-96761; May 19, 1989, 1-127549; Jun. 23, 1989, 1-161987

Int. Cl.[5] B23Q *7/10*

U.S. Cl. 29—809 **26 Claims**



1. A system for press-fitting a part into a workpiece, comprising:

a positioning device for positioning a workpiece; and

a pressing device for press-fitting a part into the workpiece which is positioned by said positioning device;

said positioning device comprising:

a jig base having a stationary reference surface;

a movable table movable toward and away from said stationary reference surface; and

pushing means for pushing said movable table to create a gap between an end surface of the workpiece and said stationary reference surface when the workpiece is placed on said movable table;

said pressing device comprising:

a presser unit including a presser rod for holding the part thereon said presser unit being movable toward and away from said movable base; and

presser means for pressing the end surface of the workpiece against said stationary reference surface to position the workpiece before the part is press-fitted into the workpiece by said presser rod.

5,067,232

METHOD FOR CONTACTING SHIELDING PLATES

Peter Seidel, Groebenzell, and Karl Zell, Niederpoecking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 8, 1991, Ser. No. 697,004

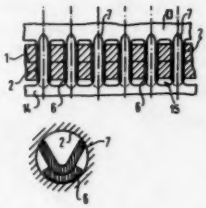
Claims priority, application European Pat. Off., May 16, 1990, 90109254.4

Int. Cl.[5] H05K *3/30*

U.S. Cl. 29—837 **3 Claims**

1. A method for contacting upper shielding plates having press-in pins and located on an upper side of a printed circuit board to lower shielding plates having press-in pins and located on a lower side of the printed circuit board, comprising the steps of: providing arcuate press-in zones for the press-in

pins of the upper shielding plates and providing V-shaped press-in zones for the press-in pins of the lower shielding plates, apexes of the arcurate and V-shaped press-in zones of the press-in pins of the upper and lower shielding plates always lying at the same side; placing the press-in pins of the upper



shielding plate free of force into holes to be through-connected in the printed circuit board; and pressing the V-shaped press-in pins of the lower shielding plate into the already occupied holes of the printed circuit board to produce a firm contacting between the respective press-in pins and the printed circuit board.

5,067,233

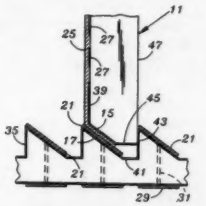
METHOD OF FORMING AN INTEGRATED CIRCUIT MODULE

Allen L. Solomon, Fullerton, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 383,429, Jul. 24, 1989, Pat. No. 4,992,908. This application Jan. 12, 1990, Ser. No. 464,440

Int. Cl.[5] H01K *3/10*

U.S. Cl. 29—852 **8 Claims**



1. A method of forming an integrated circuit module including a plurality of circuit layers bounded on at least one end by a contact board, the method comprising:

a. anisotropically etching at least one V-shaped groove in the first surface of a plurality of layers;

b. forming a trench within each of said V-shaped grooves, said trench extending into the silicon substrate beyond the depth of the V-shaped groove;

c. forming an integrated circuit structure on a first surface on each of the layers;

d. forming first conductive pads on a first inclined surface of the V-shaped groove of each of the layers, said pad being in electrical communication with the integrated circuit structure;

e. thinning each of the layers such that the thickness of each layer is substantially equal to the depth of the trench, thereby severing a portion of the layer along the trench side walls such that said first inclined surface and a first trench sidewall define a first edge portion of each layer;

f. forming a plurality of trenches on a first surface of a first contact board;

g. anisotropically etching a first vertical edge surfaces of the contact board trenches to form a plurality of layer receiving channels, each of said channels including repetitive sawtooth pattern on the circuit board first surface, each sawtooth pattern including a vertical surface and a second inclined surface and horizontal portion;

h. forming second conductive pads on each of the second inclined surfaces;

i. forming a plurality of third conductive pads along a second surface of the contact board;

j. forming conductive vias extending through the contact board connecting each of the second conductive pads with a third conductive pad; and

k. connecting a plurality of the layers to the contact board such that each layer receiving channel receives and supports one of the layers in a direction substantially orthogonal to the contact board second surface, and wherein electrical communication is effected between the third conductive pads and the integrated circuit structures.

5,067,234

TURBINE BLADE REPAIR

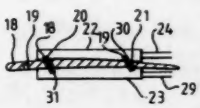
Michael J. Fraser, Droitwich, United Kingdom, assignor to Refurbished Turbine Components Limited, United Kingdom

Filed Dec. 19, 1990, Ser. No. 629,838

Claims priority, application United Kingdom, Dec. 22, 1989, 8929005

Int. Cl.[5] B23P *7/00*

U.S. Cl. 29—889.1 **8 Claims**



1. A method of repairing a turbine blade of the type having a discontinuity, the method comprising the steps of:

(a) providing a plug of approximately the same cross-section as said discontinuity;

(b) driving said plug into said discontinuity so that the plug is a tight fit in the discontinuity, without the need for any welding;

(c) carrying out the repair step to the turbine blade involving the input of stress to the blade;

(d) applying heat treatment to the blade for stress relief at least in any area where considerable thermal energy has been applied to the blade;

(e) removing said plug from said discontinuity.

5,067,235

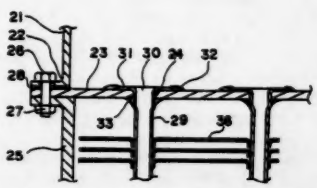
METHOD FOR JOINING HEAT EXCHANGER TUBES WITH HEADERS

Hisataka Kato, and Satoshi Takahashi, both of Hadano, Japan, assignors to Toyo Radiator Co., Ltd., Tokyo, Japan

Filed May 4, 1990, Ser. No. 519,534

Int. Cl.[5] B21D *53/06*

U.S. Cl. 29—890.043 **7 Claims**



1. A method for joining a plurality of flat heat exchanger tubes with multiple headers of a heat exchanger, said flat tubes being formed with major and minor axis side walls, said major axis side walls being shorter in length and spaced further apart than said minor axis side walls, wherein each of said headers is provided with a plurality of elliptical holes through which

each of said headers is joined with said flat tubes to form liquid-tight joints therebetween, a peripheral portion of each of said headers being joined with a flange portion of a tank body to form a tank for receiving a cooling liquid, which flows through said tubes, said method comprising the steps of:

obliquely cutting end portions of said major axis side walls of each of said plurality of flat tubes, to form trapezoidally shaped end portions of said minor axis side walls;

passing each of said end portions through corresponding ellipitical holes;

flaring each of said end portions;

bending radially outward said major and minor axis side walls of said end portions to form a bent portion which abuts each of said headers and has a relatively small width in a direction parallel to said major axis of a cross section of each of said flat tubes and a relatively large width in a direction parallel to said minor axis of said cross section of each of said flat tubes; and

brazing or soldering said bent portions to said headers and brazing or soldering each of said plurality of flat tubes to said headers.

5,067,236

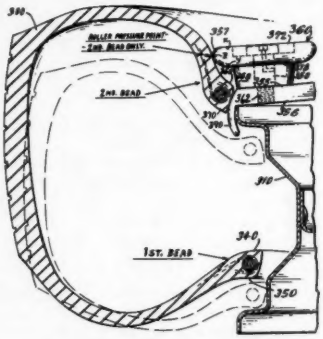
METHOD FOR MANUFACTURING AN AUTOMATIC TIRE MOUNTING AND DEMOUNTING MACHINE ROLLER

Richard E. Shifferly, 9717 Waterville-Neapous Rd., Waterville, Ohio 43566

Continuation of Ser. No. 250,527, Sep. 9, 1988, abandoned, which is a continuation of Ser. No. 247,281, Oct. 15, 1981, abandoned. This application Sep. 6, 1989, Ser. No. 403,386

Int. Cl.[5] B21D *53/00*

U.S. Cl. 29—895.3 **2 Claims**



1. A method for manufacturing a tire mounting roller rotatably affixed to a tire mounting tool for mounting a flexible tire on a tire rim, and wherein said roller has a longitudinally extending vertical central axis about which said roller is symmetrically formed and about which vertical axis said roller is rotatably mounted for free rotation relative to said tire mounting tool, said method comprising:

(a) forming a lower portion on said roller, said lower portion having an upper part and a lower part and said lower portion being shaped in the form of an inverted truncated cone with the upper part of said lower portion of said roller having a larger diameter than the lower part thereof;

(b) forming an upper portion on said roller, wherein said upper portion has an outer surface, said upper portion on said roller being formed respectively with an upper and lower part, with the lower part of said upper portion being adjacent to the upper part of said lower portion in a flush concentric manner;

(c) forming the outer surface of the upper part of the upper portion of said roller with two separate arcurate portions, each such arcuate portion having a different center point being located within the upper portion on said roller, each said arcuate portion being of different length.

5,067,237

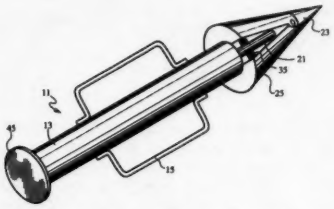
BATTERING RAM

Michael D. Holder, 244 Monterrey, Hewitt, Tex. 76643

Filed Jan. 17, 1991, Ser. No. 642,533

Int. Cl.[5] B21C *1/00*

U.S. Cl. 30—1 **20 Claims**



1. A battering ram for forcible entry through a door, comprising in combination:

an elongated body;

a pair of barbs carried by the body, extending rearward and laterally outward; and

spring means for biasing the barbs apart from each other, so that the barbs will contract when piercing the door, and expand outward once the door is pierced, hooking the door with the battering ram to enable the door to be pulled in a rearward direction with the battering ram.

5,067,238

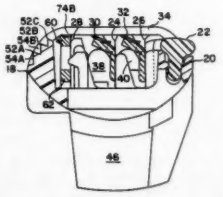
SHAVING SYSTEM

Gary R. Miller, Tewksbury; Frederick R. Borden, Brockton, and Robert A. Trotta, Pembroke, all of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Sep. 28, 1990, Ser. No. 589,998

Int. Cl.[5] B26B *19/42, 21/22*

U.S. Cl. 30—34.002 **15 Claims**



12. A shaving system comprising

body structure that incorporates guide structure,

and fixed skin-engaging structure that has skin-tensioning surface structure thereon;

blade structure carried by said body structure rearwardly of said fixed skin-engaging structure, said blade structure having a cutting edge extending along the length of said body structure,

movable guard structure carried by said body structure between and adjacent to said fixed skin-engaging structure and said cutting edge of said blade structure, said movable guard structure including a U-shaped carrier member and at least two metal strips that have crest portions extending parallel to said cutting edge and spaced less than one millimeter apart and that are secured in said carrier member, said crest portions being disposed for skin-engagement between and adjacent to said fixed skin-engaging structure and said cutting edge and having radii of curvature of about 0.01 millimeter, said movable guard struc-

ture further including integral tab portions, said guide structure in said body structure including opposed slots in which said tab portions are disposed for guiding movement of said movable guard structure along a predetermined path relative to said body structure;

a shaving aid member carried by said body structure on the other side of said blade structure from said movable guard structure;

said movable guard structure being positioned about two millimeters rearwardly of the front surface of said body structure, the cutting edge of said blade structure being positioned about three millimeters rearwardly of said front surface; and the leading edge of said shaving aid member being positioned about said millimeters rearwardly of said front surface; and

biasing structure, said movable guard structure being positioned in said body structure in engagement with said biasing structure for dynamic movement of said movable guard structure against said biasing structure as guided by said guide structure in the course of shaving.

5,067,239

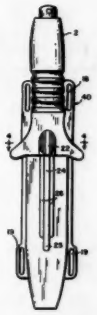
LOCK FOR KNIFE/SHEATH COMBINATION

Walter W. Collins, North, S.C., assignor to Wenoka Seastyle - A Div. of Schur, Inc., West Palm Beach, Fla.

Continuation of Ser. No. 345,695, May 1, 1989, abandoned. This application Aug. 1, 1990, Ser. No. 561,285

Int. Cl.[5] B26B *3/06*

U.S. Cl. 30—151 **7 Claims**



1. A tool and sheath combination having releasably interlocking means comprising:

said tool having a handle and a working element extending longitudinally from the end of the handle;

said sheath having inner and outer facing walls defining a pocket to receive said element on any one of a plurality of orientations;

a pair of engaging means formed on opposite sides of said handle adjacent to said working element, and a recess defining channels on either side of said engaging means; and

outwardly extending lock means on said outer wall positioned to engage said engaging means on insertion of said working element into said pocket whereby said tool is locked into said sheath, said sheath further comprising rail means positioned on said inner wall such that when said tool is inserted in said sheath, said recesses on said handle facing the inner wall of said sheath engage said rail means;

and means for supporting and moving said lock means under finger pressure from a normal lock position in a plane parallel to said facing walls to positions out of engagement with said engaging means whereby said tool may be removed from said sheath.

5,067,240

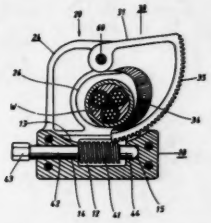
CUTTER FOR CABLE, PLASTIC PIPE OR THE LIKE

Yen-Jen You, 8F-1, No. 998 Min-Sheng E Rd., Taipei, Taiwan R.O.C.

Filed May 30, 1991, Ser. No. 707,568

Int. Cl.[5] B26B *13/00*

U.S. Cl. 30—2.49 **4 Claims**



1. A cutter for cable, a plastic pipe or the like comprising:

a base having an upper surface;

a screw rod rotatably received in said base, and including a screw portion protruding beyound said upper surface and a driving end protruding out of said base;

an immovable blade fixed to said base, and having a first curved portion having a first curved knife-edges; and

a movable blade pivotably fixed to said immovable blade, and having a second curved portion which cooperates with said first curved portion to contain therebetween a work piece and includes a second inner curved knife-edge and an outer toothed surface capable of engaging with said screw portion in a manner that when said driving end is rotated, said first and second curved knife-edges can be set in a relative motion to cut said work piece.

5,067,241

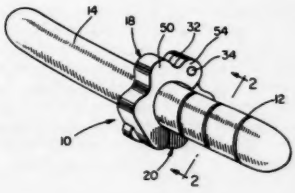
ADJUSTABLE SPIRAL SLITTER FOR HOT DOGS

Morris G. Goodman, P.O. Box 629, Freehold, N.J. 07728-0629

Filed May 8, 1990, Ser. No. 520,449

Int. Cl.[5] B26B *29/00, 3/00, 29/06*

U.S. Cl. 30—289 **2 Claims**



1. An adjustable spiral slitter for hot dogs having an external casing completely enclosing a quantity of ground meat, said slitter comprising a pair of members having opposed semi-cylindrical recesses therein, means hingedly connecting said members at one end, means adjustably connecting said members at the other end with the adjustably connected ends being separable to enable the members to be pivoted between an open and closed position, one of said members including a straight blade mounted in the recess, said blade being oriented in an inclined relation to a transverse plane perpendicular to the longitudinal center axis of the semi-cylindrical recess, said blade having a straight cutting edge and being rigidly and stationarily affixed in said one member, said recesses forming an annular passage with the blade cutting edge generally paralleling and spaced laterally from a diameter of the annular passage with the size of the interior of the annular passage

being adjustable by moving the adjustably connected ends to different adjusted positions to enable a hot dog having different circumferential sizes to be inserted through the slitter and rotated simultaneously with the cutting edge of the blade forming a spiral slit through the external casing of the hot dog with the slit extending only partially into the ground meat within the hot dog casing thereby leaving the casing and the ground meat integrally assembled thereby enabling the hot dog to be cooked in various conventional manners in a pot, pan or grill with the slit enhancing the cooking operation by eliminating the tendency of the hot dog to curl, enhancing the flavor and appearance of the hot dog and enabling the hot dog to be more easily inserted into a hot dog roll or bun.

5,067,242

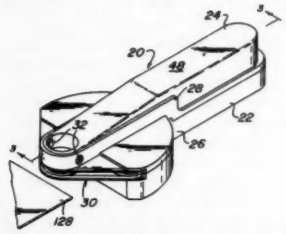
MULTIPLE DESIGN PUNCH AND EMBOSSER

Mark G. Singer, 32 E. Princeton Rd., Bala Cynwyd, Pa. 19004

Filed Jan. 23, 1991, Ser. No. 644,642

Int. Cl.[5] B26F *1/00*

U.S. Cl. 30—364 **16 Claims**



1. A punch device for punching out a plurality of designs in a sheet, said punch including a base, a multiple punch cassette and a handle, said handle having a free end and being pivotally connected to said base, said base having a punch station disposed adjacent said handle, said base punch station comprising a platform parallel to the plane in which the axis of pivot of said handle is disposed to support said cassette, said handle containing a member which contacts said cassette when said free end of said handle is pivoted toward said base, said cassette comprising a first plate containing a plurality of punches and a second plate each containing a plurality of dyes each of which is aligned with one of said punches and having a complementary opening to the shape of said punch shape, said first plate normally being spaced from and spring urged away from said second plate so that a sheet may be placed between said plates, said handle member being urged against said first plate when said free end of said handle is pivoted towards said base to cause said first plate to be urged against said second plate, said member contacting said top plate adjacent the center of said plate so that said first plate remains aligned with and substantially parallel to said second plate throughout movement of said first plate with respect to said second plate.

5,067,243

LAMINATED ADHESIVE CORE CHAIN SAW GUIDE BAR WITH CONTAINMENT AND SPACING WIRE

Timothy H. O'Neel, Milwaukie, Oreg., assignor to Blount, Inc., Portland, Oreg.

Filed Mar. 22, 1991, Ser. No. 673,413

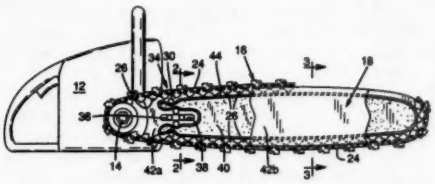
Int. Cl.[5] B27B *17/00*; B23D *57/00*; B29C *67/00*

U.S. Cl. 30—387 **6 Claims**

1. A laminated chain saw guide bar comprising:

first and second similarly shaped outer laminates each having an inner surface in face-to-face relation to the other inner surface;

a wire structure intermediate said outer laminates and contacting said inner surfaces to define a relative spacing therebetween, an exposed portion of said wire structure defining in combination with exposed portions of said inner surfaces a groove about the periphery of said guide bar, an unexposed portion of said wire structure defining in combination with unexposed portions of said inner surfaces an inner core cavity; and



an adhesive core material occupying said inner core cavity and adhering to said inner surfaces and to said wire structure.

5,067,244

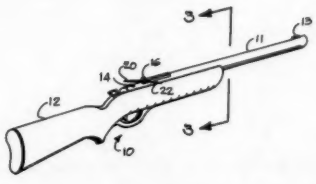
GUN SIGHT FOR SHOOTING MOVING TARGET

Fredrick N. Montalvo, #7, Box 7390, Nacogdoches, Tex. 75961

Continuation-in-part of Ser. No. 283,150, Dec. 9, 1988, Pat. No. 4,937,944. This application Jul. 3, 1990, Ser. No. 547,613

Int. Cl.[5] F41G *1/00*

U.S. Cl. 33—261 **12 Claims**



1. A gun sight for assisting a shooter in hitting a moving target with a gun having a barrel connected to a stock comprising:

a. sight ring assembly connected to the top of a gun barrel near the rear end of the gun barrel for alignment of the gun with a moving target, said sight ring assembly having

i. a base means, said base means having a top side, a bottom side, and two vertical sides, said bottom side being connected to the top of said gun barrel,

ii. a semi-circular sight ring connected to said top side of said base means, said sight ring being generally semi-circular in shape, said sight ring extending vertically upward from the top of said gun barrel, the plane in which said sight ring lies being perpendicular to the centerline of said gun barrel, and

iii. two horizontal arm means connected to said vertical sides of said base means, said arm means extending outwardly from said gun barrel generally perpendicular to the vertical axis of the stock attached to the gun barrel.

5,067,245

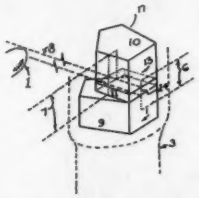
INSTANT PLACEMENT DOWN ROD

David W. Millard, P.O. Box 275, Hollywood, S.C. 29449

Continuation of Ser. No. 52,444, May 21, 1987, abandoned. This application Mar. 23, 1990, Ser. No. 497,839

Int. Cl.[5] G01C *15/00*

U.S. Cl. 33—289 10 Claims



1. A sighting device for determining the position of a football on a football field relative to a sideline of said field, said device comprising:

a rod having a housing member carried thereby;

said housing member having four apertures, a first two of said apertures are arranged along one axis and a second two of said apertures are arranged along a second axis which is perpendicular to said first axis;

a compound prism member mounted within said housing so as to intersect said first and second axises;

said compound prism member being comprised of an upper prism, an intermediate glass lens and a lower prism;

said upper prism accomodating a line of sight from one of said first of said two apertures through one of said second two apertures;

the lower prism accomodating a line of sight from said one of said first two apertures through the other of said second two apertures;

said glass lens accomodating a line of sight through said one of said first two apertures and which is at right angles to the lines of sight through said second two apertures whereby when the lines of sight through said one and said other of said second two apertures are vertically spaced and aligned parallel with said sideline, the line of sight through said second of said first two apertures is perpendicular to said sideline intermediate said one and said other line of sight so that the exact position of the football on the football field relative to said sideline is determined.

5,067,246

GAUGE FOR MEASURING TREE-TRUNK GROWTH AND THE LIKE

Benno Hesske, Salzburg; Franz Adnrae, Wilhelmsburg, and Peter Weber, Salzburg, all of Austria, assignors to Feinmechanische Optische Betriebsgesellschaft m.b.H., Salzburg, Austria

Filed Mar. 1, 1991, Ser. No. 663,101

Int. Cl.[5] G01B *3/10*

U.S. Cl. 33—555.4 14 Claims

1. A gauge for measuring a change in a dimension between one location and an adjacent location on at least one object, the gauge comprising:

a support;

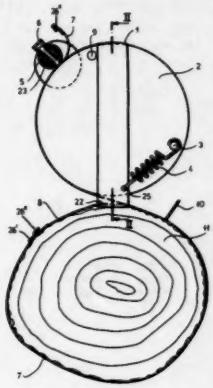
means for fixing the support at one of the locations;

a wheel pivotal on the support about an upright axis and having an outer periphery, the wheel periphery and the support having juxtaposed portions one of which is provided with a pointer and the other of which is provided with a scale, whereby the pointer moves along the scale as the wheel pivots on the support;

a flexible belt having an inner end anchored at the other location, a middle portion, and an outer end lying against the periphery of the wheel;

means for fixing the outer end to the wheel periphery; and

spring means for urging the wheel rotationally on the support in a direction pulling the middle belt portion tight between the locations, whereby as the relative positions of



the locations changes the pointer move relative to the scale.

5,067,247

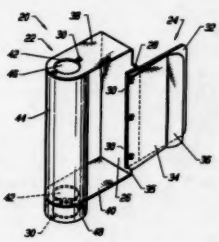
APPARATUS FOR INSTALLING A BOX INTO A WALL

Gilbert Milichichi, 39095 Zacate Ave., Fremont, Calif. 94539, and Richard G. Milichichi, 525 Saddleback Ct., Fremont, Calif. 94536

Filed Mar. 22, 1991, Ser. No. 673,677

Int. Cl.[5] B25B *11/00, 3/00*

U.S. Cl. 33—613 10 Claims



1. An apparatus for installing a box into a wall, comprising:

(A) a fastening member for temporarily securing a box to be installed into a wall; and

(B) a positioning member coupled to said fastening member, said positioning member including a handle wherein said handle includes

(1) a central vertical support;

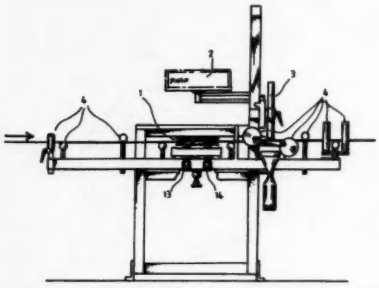
(2) an arm including a first and a second end, said first end connected to said central vertical support; and

(3) a sleeve attached to said arm proximate to said second end of said arm, said sleeve including a central longitudinal axis with a conduit along the length of said longitudinal axis, said positioning member vertically positioning said box at a desired location in respect to said wall such that said box may be permanently secured at said location while said fastening member holds said box.

5,067,248
LINEAR MEASURING APPARATUS

Bengt A. Nortenius, Hudiksvall; Per-Erik B. Olsson, Näsviken, and Nils-Erik G. Grip, Hudiksvall, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 26, 1991, Ser. No. 691,799
Claims priority, application Sweden, May 17, 1990, 9001790
Int. Cl.[5] G01B *5/04, 3/12*
U.S. Cl. 33—744 **7 Claims**



1. A linear measuring apparatus for measuring elongated material, comprising:

a measuring station which includes two endless belts which run over two belt pulleys and between which material to be measured is drawn, sensors connected to said measuring station, and a counter unit connected to said sensors for indicating material lengths, wherein said endless belts are arranged horizontally, side-by-side, and in resilient abutment with the material to be measured, wherein said sensors are pusle generators which are each connected to one belt pulley of each endless belt, pulses produced by said pulse generators being sent to said counter unit, wherein a mean value of said pulses is generated to represent the measured length;

a marking unit arranged downstream of said measuring station and connected to said counter unit, for marking the elongated material at selected points of the measured length; and

a further pulse generator connected to an other pulley of one of said belts, said pulses produced by said further pulse generator being sent to said marking unit, via said counter unit, to supply speed information to said marking unit.

5,067,249
MAP SCALING INSTRUMENT

Matthew Terrigno, 7321 Rokeby Dr., Manassas, Va. 22110

Filed Aug. 7, 1990, Ser. No. 563,604
Int. Cl.[5] G01B *3/12*
U.S. Cl. 33—773 **11 Claims**

1. An instrument for measuring and converting scale dimensions, comprising:

an elongate housing having first and second ends;

a tracing wheel rotatably supported on one end of the housing for rolling movement along a dimension to be measured;

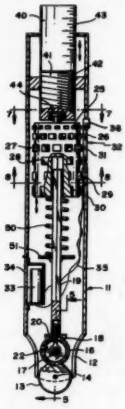
an actuator cylinder rotatably supported in the housing between the ends of the housing for rotation about an axis parallel to the axis of the housing;

gear means connected between the tracing wheel and the actuator cylinder for rotating the actuator cylinder as the tracing wheel rotates along the dimension being measured;

an electronic digital numerical display device on a side of the housing for displaying a scale measurement of the dimension being measured;

actuator means on the actuator cylinder adapted to actuate the digital numerical display device upon rotation of the tracing wheel and actuator cylinder; and

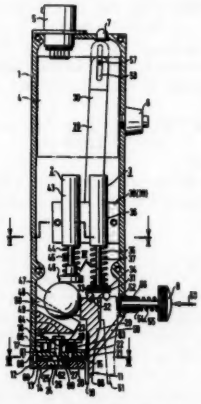
scale adjusting means on the other end of the housing, connected with the actuator cylinder for adjusting the position of the actuator cylinder relative to the digital numerical display device, whereby the instrument may be calibrated to obtain and display different scale measurements.



5,067,250
DEVICE FOR MEASUREMENT OF GAP AND FLUSH

Willi Auweiler, Cologne; Bernd Solbach, Pulheiml, and Robert Luetzeler, Cologne, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/GB89/00872, § 371 Date Feb. 8, 1991, § 102(e) Date Feb. 8, 1991, PCT Pub. No. WO90/01672, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 31, 1989, Ser. No. 651,237
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1988, 3826884
Int. Cl.[5] G01B *7/14*
U.S. Cl. 33—783 **11 Claims**



1. A measuring device for measuring the gap and/or flush between two parts (70, 71), comprising

a housing (1) having a base (13) with an application face (14)

which, in use, is placed on the surface of one of the parts (70),

a probe (11) which projects from the housing (1) and which is movable against a return force (35) in the direction of the housing (1), the probe (11) being placed in used against the other of the parts, and

at least one electro-mechanical transducer disposed within the housing (1) for detecting the displacement of the probe, characterised in that

the base (13) is pivotably connected to the housing (1), and orientation sensing means (63, 7) are provided for sensing when the housing is in a predetermined orientation in relation to the base (13).

5,067,251

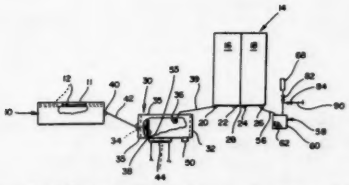
VACUUM PUMP WITH HEATED VAPOR PRE-TRAP

Yury Zlobinsky, Massapequa, and Donald A. Mattes, Huntington, both of N.Y., assignors to Savant Instruments, Inc., Framingdale, N.Y.

Division of Ser. No. 514,120, Apr. 25, 1990. This application Jan. 8, 1991, Ser. No. 638,627

Int. Cl.[5] F26B *5/04*

U.S. Cl. 34—5 **5 Claims**



1. A method for vacuum drying an aqueous and like solvents-containing specimen which comprises

disposing the specimen in a sealed drying chamber,

connecting the interior of the drying chamber to an inlet to a pre-trap chamber disposed a distance below the drying chamber so that the flow course between the drying chamber and the pre-trap inclines downwardly,

connecting the suction side of a vacuum diaphragm pump disposed a distance above the pre-trap chamber to an outlet of said pre-trap chamber in a flow course which inclines upwardly from said pre-trap chamber outlet in the direction of said pump suction side so that operation of said pump withdraws liquid and vapor solvent from said specimen along with gas products from said drying chamber as a flow into said pre-trap chamber,

gravity separating liquid solvent from the gas products in said pre-trap chamber and collecting said liquid solvent as a pool in said pre-trap chamber, and

heating the liquid solvent in said pre-trap chamber to vaporize same so that it can be withdrawn through the pump in that form and discharged to an environment outside said pump.

5,067,252

METHOD AND APPARATUS TO CONDUCT FLUIDIZATION OF COHESIVE SOLIDS BY PULSATING VAPOR FLOW

Lloyd A. Baillie, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 330,330, Mar. 29, 1989, Pat. No. 4,939,850. This application May 3, 1990, Ser. No. 518,376

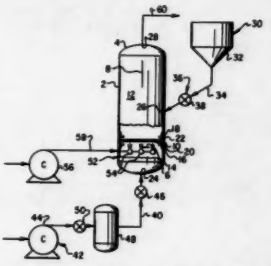
Int. Cl.[5] F26B *17/00*

U.S. Cl. 34—57 A **5 Claims**

1. Apparatus comprising:

a vessel having an upper end and a lower end; and

a gas permeable partition positioned in the vessel between the upper end and the lower end, said partition dividing the vessel into a first chamber and a second chamber, at least a portion of the gas permeable partition being movable along an axis drawn normal to the plane of the partition between a first longitudinal position and a second longitudinal position, said vessel having an inlet in the first chamber for the introduction of a fluid, an inlet in the



second chamber for the introduction of a finely divided solid, and an outlet in the second chamber for exhausting a mixture of the fluid and the finely divided solid from the second chamber; and

a pulsating source of fluidizing gas to said first chamber.

5,067,253

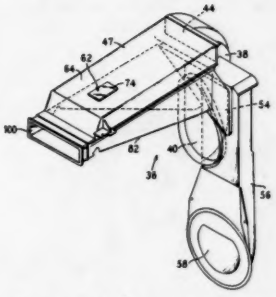
LINT COLLECTING DEVICE

Dennis W. Hauch, Baroda Township, Berrien County, and Kurt Werner, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 576,956, Sep. 4, 1990. This application Nov. 7, 1990, Ser. No. 610,026

Int. Cl.[5] B01D *55/43;* F26B *21/06*

U.S. Cl. 34—82 **6 Claims**



1. A lint collecting device mounted within an outer enclosure comprising:

an air duct, positioned within said enclosure and adjacent to a wall of said enclosure, through which lint laden air is directed;

means for collecting lint positioned in an enclosed lint collecting zone in said duct;

an air inlet and an air outlet for said air duct being positioned so as not to be visible from an exterior of said enclosure; and

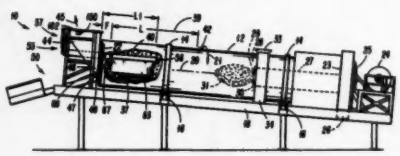
air impermeable means for rendering at least a portion of said means for collecting lint in said lint collecting zone visible through said wall of said enclosure.

5,067,254

METHOD AND APPARATUS FOR MODIFYING A VEIL OF MATERIALS IN A DRUM OF A DRYING APPARATUS

Don R. Linkletter, Cedar Rapids, and Joseph E. Musil, Ely, both of Iowa, assignors to Cedarapids, Inc., Cedar Rapids, Iowa

Filed May 25, 1990, Ser. No. 529,136
Int. Cl.[5] F26B *11/02*
U.S. Cl. 34—137 22 Claims



1. A method of drying aggregate material which comprises:

scattering the material from an upper wall of an elongate chamber over a predetermined length of the chamber to generate a veil of substantially evenly distributed falling material in an interior space of the chamber and extending in thickness over substantially the predetermined length of the chamber;

flowing hot drying gases longitudinally of the chamber through the chamber, the hot gases traversing the veil of falling materials for transferring heat energy from the hot gases to the falling materials to dry and heat the materials;

forming within the length of the veil a channel substantially void of falling material longitudinally of and within the chamber, causing at least some of the hot gases to bypass the veil of falling materials; and

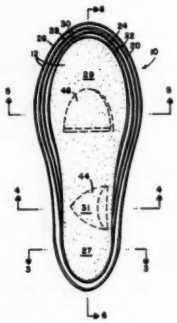
gradually varying the cross-sectional area of the channel to vary the extend to which the hot gases bypass the materials in the veil of falling materials, such bypassing hot gases retaining heat energy for controlling the temperature of gases exhausting from the chamber.

5,067,255

CUSHIONING IMPACT STRUCTURE FOR FOOTWEAR

Robert E. Hutcheson, 69 Sturges Rd., Reading, Mass. 01867

Filed Dec. 4, 1990, Ser. No. 624,071
Int. Cl.[5] A43B *13/38*
U.S. Cl. 36—43.0 20 Claims



1. A cushioning and impact absorbing insole device adapted to be placed within articles of footwear, said insole device comprising:

an upper layer and a lower layer formed of a flexible fluid impermeable material;

said upper and lower layers being sealed together by a plurality of spaced surface lines contoured to parallel each other from the outer peripheral edges to a selected inner spaced surface line;

said plurality of spaced surface lines forming a plurality of sealed laterally spaced separate tubular chambers;

said inner spaced surface line forming an inner main chamber;

said inner main chamber comprising a heel chamber section, an arch chamber section and a metatarsal chamber section;

said upper and lower layers of the transverse section of the arch chamber section being sealed together by spaced surface lines thereby forming a plurality of fluid metering jet chambers to thereby control the flow of fluid back and forth between the heel chamber section and the metatarsal chamber section;

said spaced tubular members being separately and selectively removable to thereby reduce the size of said insole device to conform to the size of a selected footwear article; and

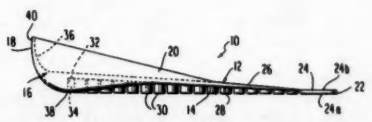
a selected volume of fluid disposed within said main chamber and said tubular chambers.

5,067,256

ACUPRESSURE HEEL CUP

H. Darrel Darby, Huntington, W. Va., assignor to Darco International Inc., Huntington, W. Va.

Filed Nov. 29, 1990, Ser. No. 619,582
Int. Cl.[5] A43B *23/08;* A61F *5/14*
U.S. Cl. 36—69 11 Claims



1. An acupressure heel cup for incorporation in footwear below the heel of the user, said heel cup comprising:

a relatively thin sole of a generally non-compressible, resilient, flexible material extending from a heel towards an arch of a foot of the user and having front, rear, laterally opposite side portions, and a bottom surface,

the rear and side portions being curved upwardly, and forming a thickened, reinforced arcuate heel support,

a horseshoe shaped rim integral with the sole portion and the heel support and projecting below the bottom surface of the sole at the rear thereof,

a plurality of laterally and longitudinally, closely spaced pegs integral with the sole over a major bottom surface area thereof, and projecting outwardly of the bottom surface of the sole,

said pegs being of decreasing vertical height from the rim to the front of said sole,

and said pegs adjacent to said rim, having a vertical height extending plantarily beyond said rim in excess of the vertical height of said rim, whereby;

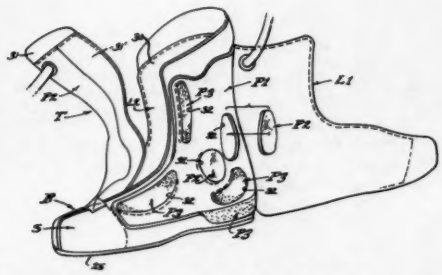
during ambulation, the posterior plantar aspect of the heel first makes contact at a proximal portion of the heel cup, the weight of the user is gradually transferred from the back to the front of the heel cup, the pegs are forced upwardly, creating individual pressure points against the soft tissues of the heel and a firm wave-like action of gentle pressure and massage is repeated, at each step of the user.

5,067,257

INJECTION FITTED BOOT LINER

Sven Coomer, P. O. Box 1929, 6175 Minaret Rd., Mammoth Lakes, Calif. 93546

Filed Oct. 18, 1990, Ser. No. 599,683
Int. Cl.[5] A43B 7/14
U.S. Cl. 36—93 24 Claims



9. A protective boot liner for insertion into and custom fitting to a wearer's anatomy by means of fluid resin injection and its subsequent solidification and including;

an outer liner for insertion into a boot shell worn over the wearer's anatomy to be protected and shaped to the general configuration of said anatomy,

an inner liner complementary to and within the outer liner and sealed therewith forming a bladder coextensive with at least one anatomical area to be protected and for the reception of fluid resin,

and a layer of nonporous padding coextensive with the inner liner and disposed within the bladder between the outer liner and the inner liner and impermeable to said fluid resin and having at least one opening at a select area of said anatomy,

there being fluid resin injection means to fill the bladder surrounding the padding and over said opening in the padding, thereby inflating the bladder and contiguously engaging the outer liner with said boot shell and the inner liner with the wearer's anatomy and to set thereat by subsequent solidification.

5,067,258

FLEXIBILITY ADJUSTER DEVICE, PARTICULARLY FOR SKI BOOTS

Pietro Martignago, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jul. 5, 1990, Ser. No. 548,339
Claims priority, application Italy, Jul. 31, 1989, 82572 A/89
Int. Cl.[5] A43B 11/00, 5/04
U.S. Cl. 36—117 15 Claims

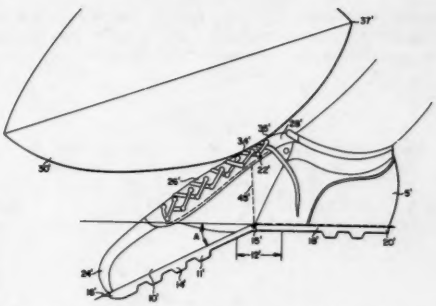
1. Flexibility adjuster device, particularly for ski boots having at least one quarter associated with a shell, comprising a locking means operated by the skier for selecting the mutual sliding between at least two overlapping flaps provided rearward to said shell, said shell having, at a rear region, a first and second flaps which mutually partially overlap, said first and second flaps partially affecting the longitudinal extension of said quarter, a depression being provided below said flaps transversely to said shell, wherein the terminal ends of said first and second flaps are mutually interconnected by means of an adapted S-shaped plate.

5,067,259

PUNTING AND SOCCER-STYLE KICKING SHOE

Paul Frugé, 828 W. 46th St., Norfolk, Va. 23508

Filed Jul. 30, 1990, Ser. No. 559,141
Int. Cl.[5] A43B 5/02
U.S. Cl. 36—133 9 Claims



1. A kicking shoe for permitting proper kicking of a sports ball comprising:

(1) an upper having:

(a) a top having a front top surface above a forward position of a user's foot, and an upper arched region above an arch of the user's foot; and

(b) a bottom arch region below the arch of the user's foot;

(2) a laced region extending along the front top surface and upper arched region of said upper, said laced region having laces therealong for securing said shoe to said user's foot and defining a forward laced region on the top front surface and an upper laced arched region on the upper arched region, said forward laced region and upper laced arched region being contiguous to one another;

(3) a bendable sole, said sole having a rear portion and a front portion, the front portion and rear portion lying in separate planes which intersect to form an angle adjacent the bottom arch region, such that when the shoe is in its normal unstressed state the front portion of the sole angles downwardly from the plane containing the rear portion but the sole is sufficiently pliable so that it will become flat under the weight of a wearer; and

(4) said laced region of said upper lying substantially in a plane angled downwardly from the plane containing said rear portion of said bendable sole so as to permit facile bending of the user's foot for achieving a desired toe depression for optimum kicking.

5,067,260

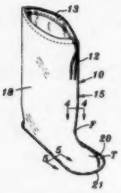
OVERBOOT WADERS

Robert B. Jenkins, Jr., P.O. Box 2089, Gastonia, N.C. 28053

Filed Mar. 19, 1990, Ser. No. 495,083
Int. Cl.[5] A43B 3/16
U.S. Cl. 36—7.10 R 3 Claims

1. In an overboot wader having a leg portion, a foot portion and a sole, the improvement which comprises making the leg portion and foot portion from a first panel of a lightweight waterproof composition, said lightweight waterproof composition consisting of a single piece of tightly woven textile fabric, a heat-sealable waterproof liner adhered to the inner surface of said textile fabric and a coating of a water impervious substance on the outer surface of the textile fabric, and the sole consisting of two panels of the same lightweight waterproof

composition heat sealed to each other and heat sealed to the first panel, whereby a pair of overboot waders may be conveniently folded into a compact package for carrying between intended uses of the overboot waders, as for wading across streams and standing in water while fishing.



5,067,261

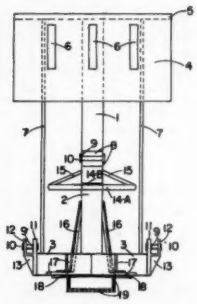
BRUSH GOPHER

James G. Betts, Rte. 5 Box 895, Coalgate, Okla. 74538

Filed Feb. 19, 1991, Ser. No. 621,852

Int. Cl.[5] A01G *23/06*

U.S. Cl. 37—2 P **7 Claims**



1. A device for clearing land of brush, roots, trees and stumps comprising:

a main frame having means for attachment of said main frame to a vehicle;

a plurality of tines extending from a lower portion of said main frame, having blade means thereon for penetrating soil to remove material from the soil, wherein said blades means have an upper cutting portion extending along the length of said tines and a lower cutting portion attached to the bottom of said upper cutting portion to form an opening whereby soil is allowed to pass therethrough;

guide means, connected to said main frame, for assisting in removal of said material; and

a protective shield connected to said main frame.

5,067,262

DIGGING TOOTH

Stephen P. Stiffler, New Enterprise; Wayne H. Beach, Roaring Spring, both of Pa., and Robert L. Frost, Sherman, Tex., assignors to Kennametal Inc., Latrobe, Pa. and Reedrill, Inc., Sherman, Tex.

Filed Aug. 3, 1990, Ser. No. 562,343

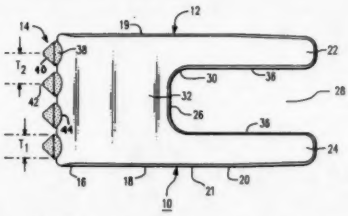
Int. Cl.[5] E02F *9/28*

U.S. Cl. 37—142 R **11 Claims**

1. A replaceable digging tooth for drilling comprising:

a body portion having a generally planar distal portion, a medial portion and a bifurcated proximal portion having at least two prongs separated from each other to form a slot which extends forwardly from said proximal end of said tooth; and

a plurality of conical inserts made of a hard wear resistant material secured to and spaced along said distal portion secured within a plurality of insert receiving holes formed in said distal portion, said conical inserts having a generally cylindrical body portion and a top portion which tapers to a point to form a tip to provide a point contact cutting attack for drilling.



5,067,263

VARIABLE GEOMETRY TILLER

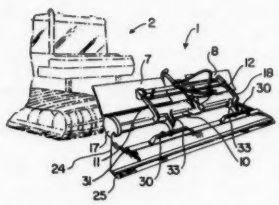
Michel Pelletier, Rockforest, Canada, assignor to Bombardier Inc., Canada

Filed Nov. 14, 1990, Ser. No. 612,463

Claims priority, application Canada, Jan. 22, 1990, 2008235

Int. Cl.[5] E01C *19/22*

U.S. Cl. 37—220 **16 Claims**



1. A snow tiller device adapted to be pulled along a snow surface, comprising:

a horizontally disposed cutting drum;

a snow chamber located to the rear of said cutting drum and extending substantially parallel thereto, said snow chamber being open at its front and bottom and including a flexible membrane by which the top of said snow chamber is bounded; and

a varying means for varying the size of said snow chamber depending on snow conditions.

5,067,264

FLEXIBLE ROTARY SNOW TILLER

Michael G. Beeley, Logan, Utah, assignor to Logan Manufacturing Company, Logan, Utah

Filed Apr. 21, 1987, Ser. No. 40,820

Int. Cl.[5] E01H *4/00*; A01B *33/16*

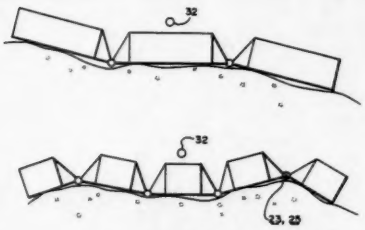
U.S. Cl. 37—222 **27 Claims**

1. A rotary snow tiller having means permitting the movement thereof over the snow by a propelling vehicle, and means permitting control thereof by the operator of the vehicle, said tiller comprising:

at least two tiller sections each having a frame and an elongate cutter bar with outstanding snow cutting teeth;

means flexibly connecting the tiller sections together end to end, said connecting means comprising hinges connecting the frames, each frame hinge having an axis lying generally in the direction of tiller travel, and universally flexing joints connecting the cutter bars, each joint having a center of flexure geometrically fixed with respect to said joint and being supported in fixed relationship to one of the frames so that the associated frame hinge axis passes

through said fixed center of flexure, and so that the frame and the cutter bar of each tiller section are constrained to rotate about an associated frame hinge as a unit in fixed geometric relationship to each other; and



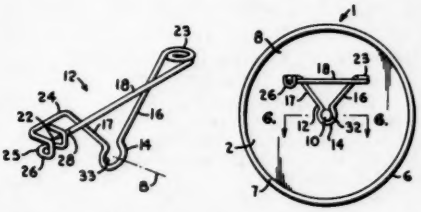
means connecting at least one of the tiller sections to the propelling vehicle.

5,067,265

BADGE AND MOUNTING ASSEMBLY

Jeffrey W. Harms, Olathe, Kans., assignor to Gill Studios, Inc., Shawnee Mission, Kans.

Filed May 23, 1990, Ser. No. 528,035
Int. Cl.[5] A44C *3/00*
U.S. Cl. 40—1.5 **7 Claims**



1. A latchable pin mounting device comprising:

(a) a base portion in the form of a circular segment and lying in a first plane having an arc greater than a semi-circle such that said base portion has a curved configuration located about an axis and is adapted to be coaxially secured to a post;

(b) a first arm portion connected to one end of said base portion to support a pin portion by bias pivoting means substantially spaced relationship to said base portion;

(c) a second arm portion connected to the other end of said base portion to support a latching portion having a finger for operably retaining said pin when positioned in a latched configuration thereof;

(d) said pin portion adapted to removably attach said pin mounting device to penetrable material; said pin portion having an open configuration and said latched configuration both within a common second plane spaced orthogonal to said first plane, such that in use said pin portion is offset from said base portion.

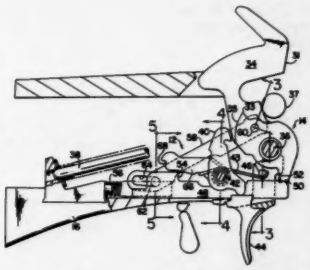
5,067,266

HAMMER SAFETY MECHANISM

David Findlay, Guilford, Conn., assignor to Guilford Engineering Associates, Inc., Guilford, Conn.

Filed Oct. 10, 1990, Ser. No. 595,189
Int. Cl.[5] F41A *17/48, 17/76*
U.S. Cl. 42—70.08 **21 Claims**

1. In a firearm having a hammer supported for movement between cocked and striking positions, biasing means for urging the hammer towards its striking position, and trigger mechanism including a trigger supported for movement between ready and firing positions, the trigger mechanism being operative to hold the hammer in its cocked position when the trigger is in its ready position and to release the hammer from its cocked position in response to movement of the trigger to its firing position, the improvement comprising a hammer block supported for movement between hammer blocking position wherein said hammer block is disposed in the path of hammer movement toward its striking position and hammer releasing position wherein said hammer block is out of the path of movement of the hammer to its striking position, connecting means for moving said hammer block to hammer releasing position in response to movement of said hammer to its cocked



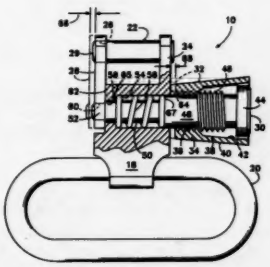
position and retaining said hammer block in hammer releasing position while said hammer remains in said cocked position, enabling means for moving said hammer block to hammer blocking position in response to release of said hammer from its cocking position while said trigger is in its ready position and retaining said hammer block in hammer blocking position to prevent said hammer from attaining its striking position, and disabling means for releasably securing said hammer block in hammer releasing position in response to movement of said trigger to its firing position when said hammer is in its cocked position to permit said hammer to move to its striking position.

5,067,267

QUICK-DETACHABLE SECURITY-TYPE SLING SWIVEL

Robert K. Ives, Corbett, Oreg., assignor to Michaels of Oregon Co., Portland, Oreg.

Filed Nov. 9, 1990, Ser. No. 611,165
Int. Cl.[5] F41C *23/02*
U.S. Cl. 42—85 **6 Claims**



1. A quick-detachable firearm sling swivel, comprising:

(a) a body;

(b) selectively openable attachment means operatively associated with said body, for attaching said sling swivel to a mounting base;

(c) plunger means for opening said attachment means, said plunger means including a plunger interconnected with said attachment means and attached movably to said body so as to be movable with respect to said body between an extended position, in which said attachment means is in a secured condition, and a releasing position, in which said

attachment means is openable to permit said sling swivel to be attached to or removed from said mounting base; and

(d) security means mounted on said plunger for selectively preventing said plunger from being moved to said releasing position, said security means being movable on said plunger between an operative first position, wherein said security means is rotatable on said plunger without moving axially therealong and wherein said security means prevents said plunger from being moved to said releasing position, and an inoperative second position wherein said security means is displaced axially of said plunger from said operative first position, and wherein said security means does not prevent said plunger from being moved to said releasing position.

5,067,268

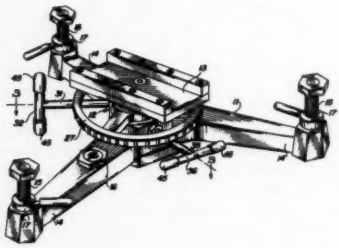
RIFLE REST

Charles R. Ransom, 134 S. Horizon Cr., Prescott, Ariz. 86303

Filed Aug. 27, 1990, Ser. No. 572,703

Int. Cl.[5] F41A *23/14*

U.S. Cl. 42—94 **5 Claims**



1. A rifle rest comprising a base, a cradle, and a mechanism for permitting adjustment of the elevation of the cradle with respect to said base, said mechanism comprising a hub formed in said base, a collar slidably received in said hub, means connecting said collar to said cradle, means for locking said collar in position in said hub, said locking means comprising a locking member, a shaft having one end connected to said member and extending radially outwardly from said collar, the other end of said shaft having a handle thereon, the portions of said shaft and said handle which are spaced outwardly of said hub being fabricated substantially entirely of tubular material.

5,067,269

ICE FISHING TIP-UP WITH INDICATOR LIGHT AND FLAG

David M. Eppley, 2312 8th Ave. N., and Robert L. Charpentier, 3518 3rd Ave. N., both of Great Falls, Mont. 59401

Filed Jan. 24, 1991, Ser. No. 645,986

Int. Cl.[5] A01K *97/00*

U.S. Cl. 43—17 **1 Claim**

1. A tip-up for use in ice fishing, said tip-up comprising:

a horizontal base to be placed across a hole in an ice surface,

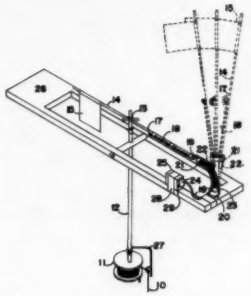
a fishing line supply means depending from said base for Ser. No. 07/645,986 (Eppley, Charpentier) Amndmnt A, contd. insertion in said hole in said ice surface;

trigger means on said base and operatively engageable with said fishing line supply means to be operated in response to a strike on said line;

moveable signal means adjoined to said base by a bias coil spring, said signal means having operative vertical and inoperative horizontal positions and being engageable with said trigger means to hold said signal means in its inoperative position in the absence of said fish strike on said line, said visual signal means being in the form of a flag and a staff mounted on said base by said bias coil spring and moveable by actuation of said trigger means from said inoperative position to an operative upright vertical position;

a lighting device connected to said moveable signal means and to said bias coil spring comprising;

a bulb connected to wiring, said wiring in turn is connected to two collars, one of which is a non-conductive collar



with a metal plate and one of which is a conductive collar that is inserted into said base, said collars and bulb connected to a power source by way of said wiring, said metal plate completes an electrical circuit when it plate comes into contact with said bias coil spring when the visual signaling device flag staff comes into a stationary upright position.

5,067,270

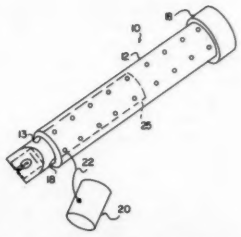
METHOD AND APPARATUS FOR DISPENSING LIVE FISHING BAIT

James C. Garrick, Grove Hill, Ala., assignor to Judges Kricket Kisser, Inc., Grove Hill, Ala.

Filed Apr. 20, 1990, Ser. No. 512,171

Int. Cl.[5] A01K *97/04*

U.S. Cl. 43—55 **17 Claims**



1. A confinement and dispensing apparatus for live fishing bait of the type including crickets, grasshoppers or the like, said confinement and dispensing apparatus comprising:

a storage chamber having at least one air ventilation passage and being operable to contain live bait within said storage chamber;

means for inserting live bait into said storage chamber; and

a containment and hooking chamber axially positioned at one end of said storage chamber and being operable to facilitate hooking engagement and removal of live bait from said storage chamber, said containment and hooking chamber including,

a first end of said containment and hooking chamber operable to allow passage of live bait from an interior portion of said storage chamber to an interior portion of said containment and hooking chamber,

a hooking station at a second end of said containment and hooking chamber operable for facilitating impaling live bait upon a fishing hook, said hooking station having a

longitudinal channel extending away from said first end of said containment and hooking station, and

an end closure operable to be releasably attached to said first end and having an aperture for permitting the passage of air into said containment and hooking chamber such that externally applied air pressure operably forces live bait contained within said containment and hooking chamber toward said longitudinal channel, and

at least one slot extending longitudinally along said hooking station and having a depth such that said at least one slot opens into said longitudinal channel, said at least one slot operable to guide a hook from one side of said hooking station through live bait positioned in said hooking station and to permit exit of the hook from said hooking station with live bait attached.

5,067,271

IMPRISONING TRAP

Joergensen Henning, Noerrehald 4, Ebeltoft, Denmark

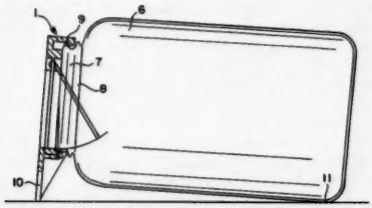
PCT No. PCT/DK89/00040, § 371 Date Aug. 30, 1990, § 102(e) Date Aug. 30, 1990, PCT Pub. No. WO89/07887, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 22, 1989, Ser. No. 571,596

Claims priority, application Denmark, Mar. 1, 1988, 1093/88; Nov. 17, 1988, 6430/88

Int. Cl.[5] A01M *23/02*

U.S. Cl. 43—60 **6 Claims**



1. A trap for capturing small animals or reptiles which comprises a transparent receptacle having a neck that defines an entrance mouth and first connecting means, and a cover which is releasably engaged with the receptacle, said cover including:

a frame member which defines an entrance opening, two support legs, and a second connecting means, said second connecting means engaging said first connecting means so as to attach said frame member to said receptacle so that said entrance opening is in communication with said entrance mouth, said frame member defining a contact surface facing said receptacle,

a grating member pivotally connected to said frame member so as to move between open and closed positions relative to said entrance opening, said grating member contacting said contact surface when in said closed position, said grating member including a locking hook, and

holding means for retaining said grating member in said closed position, said holding means comprising a stop latch provided at one end with a serrated pawl for engagement with said locking hook, said pawl having a steep side, and a substantially U-shaped flat spring having two legs, one of said two legs being connected to said stop latch and a second of said two legs being capable of exerting a spring force perpendicular to said steep side of said pawl and wedging the locking hook against said pawl.

5,067,272

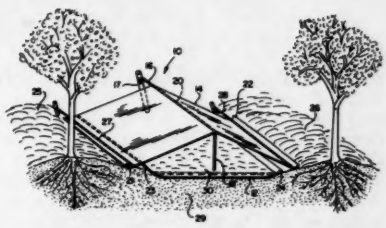
APPARATUS FOR WATER DESALINATION AND DRIP IRRIGATION OF ROW CROPS

James E. Constantz, Portola Valley, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 9, 1989, Ser. No. 265,109

Int. Cl.[5] A01G *27/00, 13/04*

U.S. Cl. 47—27 **10 Claims**



1. An apparatus for providing purified water to row crops comprising:

a lower layer of dark plastic sheeting designed to be placed over the length of a strip of land between two crop rows, said dark plastic sheeting layer capable of providing a basin for impaired water;

a supporting means disposed lengthwise above said dark plastic sheeting layer and capable of supporting a clear plastic sheet in such a manner that the clear plastic sheet will take the shape of an inverted V over said dark plastic sheeting layer when draped over said supporting means;

an upper clear plastic sheet positionable above said dark plastic sheeting layer and retainable in an inverted V shape by said supporting means, said supporting means running lengthwise down the center of said clear plastic sheet so as to form the apex of the inverted V, the lateral outer edges of said clear plastic sheet extending to a point beyond the lateral outer ends of said dark plastic sheeting layer so that the outer edges of said clear plastic sheet are not connected to the lateral outer ends of said dark plastic sheeting layer and so that purified water which condenses on the underside of said clear plastic sheet due to the evaporation if impaired water in the basin provided by the dark plastic sheeting layer is directed to roll down along the underside of said clear plastic sheet and contact the ground in the vicinity of a crop row; and

means to firmly hold down the outer lateral edges of said clear plastic sheet against the soil in the vicinity of a crop row.

5,067,273

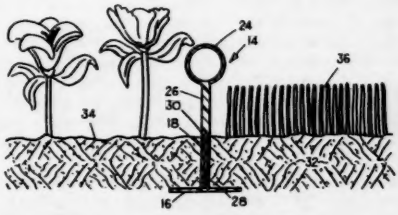
LAWN EDGING

Mark H. Richwine, 7921 Stockwell St., Lincoln, Nebr. 68506

Filed May 17, 1990, Ser. No. 525,120

Int. Cl.[5] A01G *1/00*

U.S. Cl. 47—33 **2 Claims**



1. Lawn edging, comprising:

an elongated top portion removably cooperable with an elongated base portion;

said base portion having a pair of parallel upstanding walls with a slot formed between said walls; and

said top portion having a depending flange adapted to cooperate with said slot to form a single integrated unit, said depending flange having a length, depth and thickness substantially equal to said slot so as to slide vertically within the slot to completely fill said slot when said top portion and base portion are cooperably joined;

said top portion including a generally vertical strap extending the length of the top portion, said strap having a lower edge;

said depending flange having a thickness less than that of the strap and depending generally centrally from the lower edge thereof, so as to form shoulders on each side of the flange at the juncture to said lower edge;

said upstanding walls and slot therebetween having a total thickness equal to the thickness of said strap, so as to form flush vertical surfaces from said strap to said walls when said top and base portion are cooperably joined;

said base portion further comprising a generally horizontally oriented base strip from which said parallel walls project vertically upwardly, said strip located so as to project perpendicularly outwardly from said walls;

said top portion including an enlarged ridge portion wider than said depending flange and extending the length of said top portion to strengthen said top portion.

5,067,274

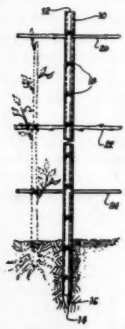
TOMATO IRRIGATION AND SUPPORT POLE

Richard L. Lewis, 4080 Hancock St. #3806, San Diego, Calif. 92110

Continuation-in-part of Ser. No. 371,824, Jun. 27, 1989, abandoned. This application Jan. 22, 1990, Ser. No. 468,234

Int. Cl.[5] A01G *17/14*

U.S. Cl. 47—47 **1 Claim**



1. A tomato growing pole comprising an elongated member having a pointed bottom end that is substantially tapered to a point to be driven into the soil and having a plurality of longitudinally spaced V-shaped notches entrant at an angle between orthogonally and parallely of said member, each notch converging substantially uniformly from its widest portion at the entrance into the side of said pole to its narrowest portion at the point of the notch furthest into the interior of the pole, with the narrowest portion of each notch being longitudinally displaced on said pole toward said bottom portion from said widest portion, such that when driven partially into the soil at said bottom end said notches can seat variously shaped and sized sticks and poles when wedged into respective ones of said notches, with the weight of the sticks and poles holding them in the notches due to the angular orientation of the notches to support a tomato plant.

5,067,275

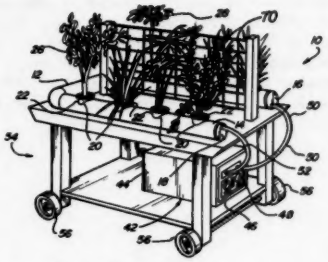
HYDROPONIC GARDEN

Gerald D. Constance, 7225 Warren Rd., Ann Arbor, Mich. 48105

Filed Feb. 22, 1990, Ser. No. 482,889

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—62 **7 Claims**



1. A hydroponic garden, comprising:

a closed conduit having an upper wall with spaced openings therethrough;

a plurality of plant growing chambers, one chamber for each of said openings, said chambers having a side wall and a bottom wall and being open at the top of said side wall, said chambers further having an aperture through said bottom wall, said chambers being placed in said openings in said conduit to support said chambers therein;

means for periodically filling said conduit with a plant nutrient solution to a level above the bottom wall of said chambers and for draining said nutrient solution from said conduit, said filling and draining means includes a reservoir for said nutrient solution disposed at an elevation below said conduit, pump means in fluid communication with said reservoir, a fill tube coupled at one end to said pump means outlet and coupled at the opposite end to said conduit at a level below the bottom walls of said chambers and an overflow tube coupled at one end to said conduit at a level above the bottom walls of said chambers and routed downwardly therefrom to said reservoir whereby when said pump means is operated nutrient solution flows into said conduit from said fill tube raising the level of nutrient solution in said conduit to the level of said overflow tube after which nutrient solution flows through said overflow tube back to said reservoir and after said pump means is stopped, nutrient solution drains from said conduit through said fill tube and pump means back into said reservoir to lower the nutrient solution level in said conduit to the level of said fill tube therein.

5,067,276

SEMI-AUTOMATIC GATE

Kenneth R. Brandt, Sr., 1022 Avenue D, Billings, Mont. 59102

Filed Feb. 19, 1991, Ser. No. 657,413

Int. Cl.[5] E05F *11/00*; E06B *11/00*

U.S. Cl. 49—331 **5 Claims**

1. A new and improved semi-automatic gate comprising,

frame support means;

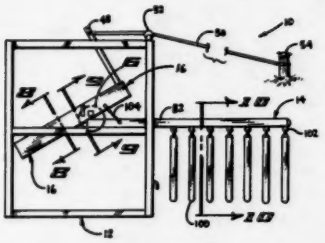
gate means for selectively blocking a roadway and being pivotally attached to said frame support means;

balance means mounted to the frame means and the gate means for effecting a pivotal movement of said gate means;

manual control means for controlling said balance means, thereby to effect said pivotal movement of said gate means;

said balance means comprises a closed container pivotally attached to said frame support means, said closed container having a supply of selectively shiftable fluid container therein, said manual control means being operable

to effect a pivotal movement of said closed container to thereby shift said fluid within said container, thus to effect said pivotal movement of said gate means, and



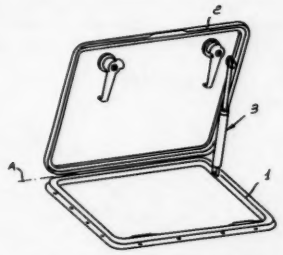
wherein said gate means includes a closed compartment having a second fluid supply contained therein, said second fluid supply being shiftable within said closed compartment to further assist said pivotal movement of said gate means.

5,067,277

SHUTTER OPENING DEVICE PARTICULARLY FOR PLEASURE CRAFT HATCHWAYS

Gianfranco Magalotti, Cella, Italy, assignor to NEMO S.p.A., Sarsina, Italy

Filed Jul. 30, 1990, Ser. No. 559,911
Claims priority, application Italy, Aug. 4, 1989, 4886/89[U]
Int. Cl.[5] E05F *1/10*
U.S. Cl. 49—386 **1 Claim**



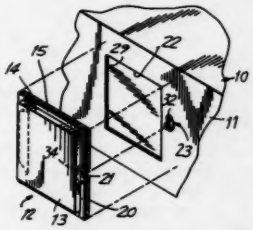
1. Shutter opening device, particularly for pleasure craft hatchways, comprising a pneumatic cylinder of the "gas spring" type for the actuation of the closure shutter of the hatchway, said cylinder having a stem provided with an end tang wherefrom a control rod protrudes, a head associated to said tang, said head being formed by two mutually parallel walls which are separated by an interspace and are joined by a lower bridge, one of said walls having a through opening and the other of said wall extending with a sleeve which is coaxial with said through opening, thus defining a seat extending through said interspace, a comand lever for actuating said control rod articulated to the end of the stem and a button slidably engaging said seat and adapted for keeping said lever in one of two positions, said lever actuating, in one of said positions, the rod in a position for the free sliding of the stem in both directions, said lever actuating, in the other position, said rod in a position for securing the stem, said sleeve having an internal raised portion which defines a shoulder and said button being constituted by a pin having two portions with different diameters which define a shoulder, the smaller-diameter portion engaging said sleeve and the larger-diameter portion having a notch formed proximate to said shoulder, a spring being superimposed on said smaller-diameter portion, said spring being compressed between said shoulder of the button and said shoulder of the sleeve, said lever comprising two arms which are perpendicular to one another, a first one of said arms extending substantially parallel to the stem of said cylinder, the other one extending with a handgrip, said first arm engaging said notch in said position for securing the stem and out of said notch in said position for free sliding of the stem.

5,067,278

ACCESS DOOR FOR AIR FLOW CONDUITS

John Lyons, Leviton, N.Y., assignor to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Dec. 7, 1990, Ser. No. 623,366
Int. Cl.[5] E06B *3/32*
U.S. Cl. 49—463 **3 Claims**



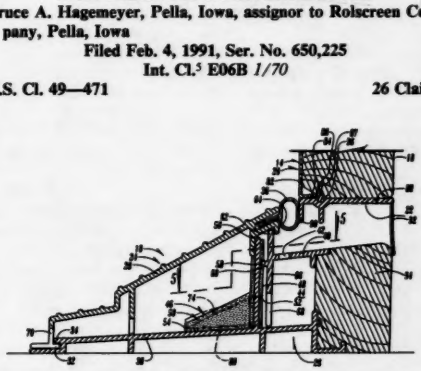
1. An access door assembly for an air flow duct comprising a door including a generally planar back portion, a perimeter member projecting from the margins of said back portion, a continuous surrounding flange extending from said perimeter member, the surfaces of said flange being disposed in co-planar alignment, gasket means fixed to said surfaces of said flange for forming a continuous seal against a duct surface, a ramp member forming an extension of said flange, said ramp member extending in a direction angularly away from said back portion and projecting outward beyond said perimeter member, said ramp member defining an acute angle with said flange, clamp means adapted to be pivotally mounted to said duct at a position overlying said flange and diametrically opposite said ramp, said clamp means including first arcuate cam surface means positioned to engage said perimeter member for urging said door member laterally away from said clamp means, and second cam surface means for engaging said flange and urging said door tightly against said duct responsive to pivotal movement of said clamp means.

5,067,279

SELF DRAINING DOOR THRESHOLD

Bruce A. Hagemeyer, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed Feb. 4, 1991, Ser. No. 650,225
Int. Cl.[5] E06B *1/70*
U.S. Cl. 49—471 **26 Claims**



1. A self draining door threshold comprising,
a threshold having a sill, said sill having an exterior section adapted to be positioned on the exterior side of a door and

an interior section adapted to be positioned on the interior side of a door,

a check valve positioned in said sill and having an inlet side for receiving water from the interior section and an outlet side adapted to open to operatively drain water to the exterior side of a door, and

said check valve including a passageway converging from a substantially open end at said inlet side to a substantially normally closed end at said outlet side, said passageway including a flexible side wall in said exterior section which is adapted to be exposed to the exterior air pressure whereby water will flow through said check valve when pressure generated by said water in said passageway exceeds the opposing exterior air pressure combined with pressure required to flex said flexible side wall to open said closed end.

5,067,280

WEATHER STRIP AND APPARATUS AND PROCESS FOR MANUFACTURING THE SAME

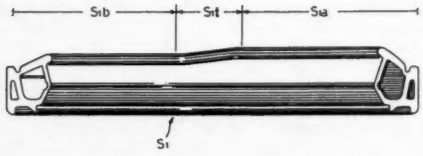
Hidetoshi Arima, Obu, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Obu, Japan

Filed Nov. 13, 1990, Ser. No. 611,940

Claims priority, application Japan, Nov. 14, 1989, 1-295616; Nov. 22, 1989, 1-303756

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—498 **9 Claims**



1. A weather strip for use on an automotive door to seal a clearance formed between the door and an opening edge of a body when the door is closed, comprising a first weather strip portion and a second weather strip portion which are integrally formed as a unit, the outer circumferential length of said second weather strip portion being less than the outer circumferential length of said first weather strip portion, the inner circumferential length of said second weather strip portion being also less than the inner circumferential length of said first weather strip portion so that the thickness of said second weather strip portion is substantially identical with the thickness of said first weather strip portion, the reduction in the outer and inner circumferential length being achieved during extrusion of the weather strip.

5,067,281

DOOR GLASS CASSETTE FOR VEHICLES

Ronald E. Dupuy, Wabash, Ind., assignor to Gen Corp Inc., Fairlawn, Ohio

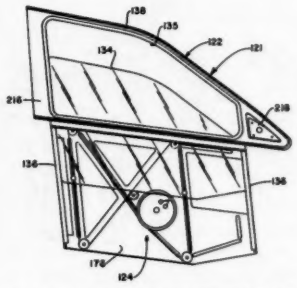
Continuation-in-part of Ser. No. 412,978, Sep. 26, 1989, Pat. No. 5,001,867. This application Oct. 25, 1990, Ser. No. 604,682

Int. Cl.[5] B60J *5/04*

U.S. Cl. 49—502 **48 Claims**

1. A door glass cassette adapted to be fitted within and secured to a vehicular door structure to provide a raisable and lowerable glass window, said door glass cassette comprising:

a frame and seal assembly comprising two laterally spaced curvilinear side channels adapted to provide vertical runs for raising and lowering the glass pane, a curvilinear top channel extending between the side channels at the top of each said side channel, and lateral guide means comprising transversely spaced lateral guides secured between said side channels, said lateral guide means being a Z-shape inside channel and a short vertical height I-shape outside channel, said channels and guide means collectively defining a glass opening in said door glass cassette, each said channel and said guide means having secured thereto an



interior seal and an exterior seal adapted to cooperatively engage said glass pane adjacent to said glass opening.

5,067,282

METHOD AND APPARATUS FOR NON-CONTACT MEASURING AND, IN CASE, ABRASIVE WORKING OF SURFACES

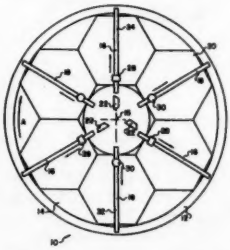
Karl-Hermann Netzel, assignor to HPO Hanseatische Prazisions-und Orbittechnik GmbH, Fahrenheitstrasse, Fed. Rep. of Germany

Continuation of Ser. No. 365,746, Jun. 13, 1989, abandoned. This application Dec. 7, 1990, Ser. No. 625,640

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820225

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.77 **60 Claims**



1. Method for the non-contacting measuring of surfaces, in particular of large-surface mirrors, with which, for determining contour deviations of the surface, established is the difference between interferometrically detected surface contour actual values and preselected surface contour desired values, characterized by the fact that

a) a reference contour of at least one reference element, the extension of which corresponds essentially to a measuring region of the surface, is measured interferometrically relative to a standard whose geometry is known to within the allowable contour tolerance of the surface;

b) that the surface to be measured is brought into a defined spatial location relative to the reference element and

c) the distance of the reference contour from the measuring region of the surface is detected incrementally by interferometric means and the relevant difference between actual value and desired value is determined.

5,067,283

METHOD AND DEVICE FOR THE TREATMENT OF THE UPPER SURFACES OF RAILS

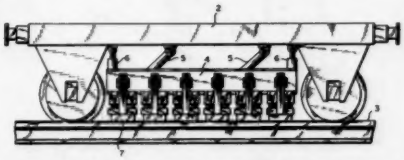
Josef Pomikacsek, Altmunster, Austria, assignor to Firma, Linsinger Maschinenbau GmbH, Steyrermuhl, Austria

Filed Nov. 13, 1990, Ser. No. 611,793

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1989, 3937812

Int. Cl.[5] E01B *31/17*

U.S. Cl. 51—178 20 Claims



1. A method for the treatment of the surfaces of rails, where the surfaces of the rails are acted upon by means of a plurality of movable grinding blocks disposed on a bogie which is moved along on the tracks, comprising the steps of:

a. periodically lowering at least one of said grinding blocks into a work position during operation and subsequently lifting said at least one of said grinding blocks into a position of rest,

b. maintaining at least one grinding block in a work position during operation, and

c. cleaning the work face of each grinding block while it is in the position of rest.

5,067,284

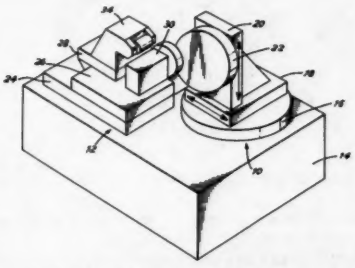
MACHINE TOOL

Peter H. Putnam, Enderby, and Michael P. Durcan, Ravenstone, both of England, assignors to Ex-Cell-O GmbH, Eisling/Fils, Fed. Rep. of Germany

Continuation of Ser. No. 242,881, Sep. 12, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 454,693

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—281 R 8 Claims



1. A method of machining a workpiece by a cutting tool, comprising:

mounting said workpiece on a workhead;

positioning defined locations of a shape to be machined on said mounted workpiece in a plane of interpolation by positioning said workhead about a first machining axis being a rotary axis and extending perpendicular to said plane of interpolation, positioning said workhead along a second rectilinear machining axis being an X-axis and extending parallel to said plane of interpolation, and positioning said workhead along a third rectilinear machining axis being a Y-axis and extending parallel to said plane of interpolation;

arranging a working tool rotating about a tool axis with said tool axis being in a predetermined orientation with respect to said plane of interpolation; and

controlling said positioning about said first machining axis and along said second and third rectilinear machining axes for obtaining a movement of said workhead in said plane of interpolation such that said workpiece is moved with respect to said working tool according to said shape to be machined.

5,067,285

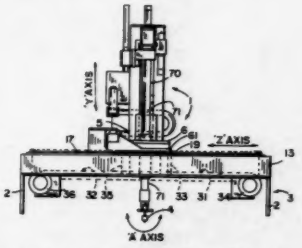
SEAL BELT ASSEMBLY FOR COMPARTMENTS IN WHICH BLASTING, SPRAYING AND THE LIKE OPERATIONS ARE PERFORMED

Martin J. Hilbrands, Grand Rapids, Mich., assignor to Progressive Blasting Systems, Inc., Grand Rapids, Mich.

Filed Apr. 16, 1990, Ser. No. 509,957

Int. Cl.[5] B04C *9/00*

U.S. Cl. 51—426 8 Claims



1. Apparatus for treating an object within an entirely enclosed compartment having enclosed sides and an enclosed ceiling covering the top of said compartment including an operative device manipulated by a robot manipulator means having an elongated mast extending downwardly through the ceiling of said compartment and supporting said device at its lower end for movement within said compartment;

means for enclosing said ceiling in which said manipulator means adjusts the mast during such treatment and while it is extending through said ceiling, such adjustment being in directions at least along a given axis;

said manipulator means including an elongated carriage assembly extending in a direction orthogonal to said given axis and spanning the distance between first and second parallel sides of said compartment; means for causing said carriage to move along said given axis between third and fourth compartment sides extending between said first and second compartment sides;

a seal belt subassembly connected to the longitudinal sides of said carriage and extending over said top of said compartment to said third and fourth sides, whereby as said carriage moves, said seal belt subassembly covers the openings in the compartment top between said carriage and third and fourth sides; the improvement comprising:

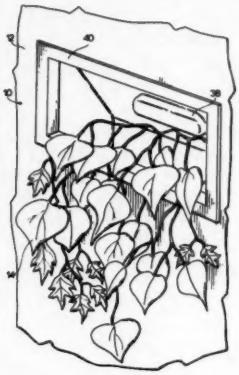
said seal belt subassembly including a flexible belt material with a plurality of rigid elongated members attached to said belt material and extending between said first and second sides; said rigid elongated members providing support for said flexible belt, to prevent said belt from sagging, said members providing a noise restraining means, and said members having means to sustain the weight of a worker to provide a safety feature should a worker accidentally step on said seal belt subassembly.

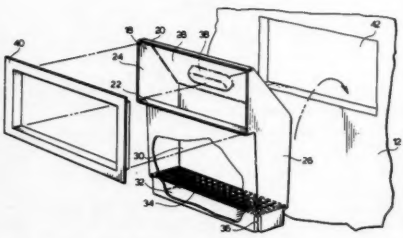
5,067,286

PLANTER

Raymond P. Richer, 872 Lochness Crescent, Oshawa, Ontario, Canada L1J 7P8

Filed Feb. 13, 1990, Ser. No. 479,426
Claims priority, application Canada, Feb. 13, 1990, 590910
Int. Cl.[5] A47G *7/02*
U.S. Cl. 52—27 **10 Claims**





1. A planter for mounting within a wall comprising a generally rectangular front port opening into a plant display portion having a downwardly sloped rear wall such that said display portion rapidly decreases in size from said front port to a point of maximum depth of said display portion, and a downwardly tapered soil holding portion of a height greater than the height of said front port, said soil holding portion being located below said front port and located below and within the depth of said plant display portion, said downwardly sloped rear wall of said display portion and said tapered soil holding portion being of a shape and cooperating to accommodate insertion of said planter through an aperture in a wall generally corresponding to the front port with a clearance behind the wall generally equal to the maximum depth of said display portion.

5,067,287

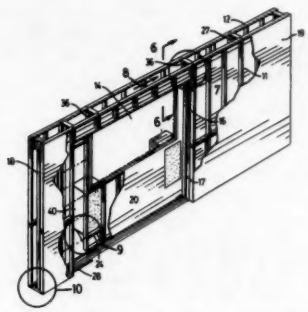
DISPLAY WALL ASSEMBLY

Kenneth T. Lewis, 77 Willett Crescent, Richmond Hill, Ontario, Canada L4C 7W5

Filed Jun. 25, 1990, Ser. No. 542,876
Int. Cl.[5] G09B *5/06;* **B43L** *1/10*
U.S. Cl. 52—29 **9 Claims**

1. A wall assembly for displaying visual messages comprising:

a front sound absorption portion, a rear portion which when assembled with said front portion provides between them a storage space, a display area providing an opening through said front and rear portions, a projector screen unit stored in said storage space and movable across said open space, a whiteboard panel movable sideways from said storage space to cover said opening, a right cover panel and a left cover panel both stored in and movable



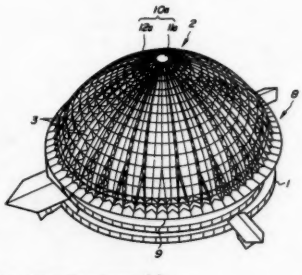
from opposite sides of said storage space to cover said display area.

5,067,288

DOME STRUCTURE

Yoshihiro Takahama; Kazushige Kurihara, and Takayuki Nishiya, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed May 15, 1990, Ser. No. 523,720
Claims priority, application Japan, May 16, 1989, 1-122637
Int. Cl.[5] E04B *01/32*
U.S. Cl. 52—80 **5 Claims**



1. A dome structure, comprising:

a base;

an upper assembly erected on and extending upward and inward from the base, and including

i) a bottom section contacting and supported by the base, and

ii) a plurality of arch-shaped steel trusses connected to and extending upward and inward from said bottom section, each of the trusses including an upper end portion, a plurality of upper chord members and a plurality of lower chord members; and

a ring assembly engaging and supporting the upper end portions of the trusses, and including at least upper and lower pairs of rings engaging upper end portions of the trusses, and wherein

i) each ring of each of said pairs has a diameter different than the diameter of the other ring of the pair,

ii) the rings of the upper pair of rings are connected to and support the upper chord members, and

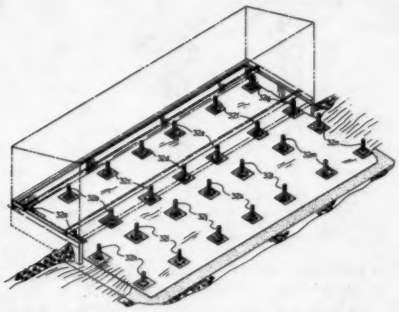
iii) the rings of the lower pair of rings are connected to and support the lower chord members.

5,067,289

FOUNDATION SYSTEM FOR MANUFACTURED HOUSING

Dale L. Ouderkirk, R.R. 1, Box 107, and Donald R. Ouderkirk, Rte. 47, both of Redfield, N.Y. 13437

Filed Jun. 28, 1990, Ser. No. 545,381
Int. Cl.[5] E04B *1/02*; E04G *21/00*; E02D *27/10*
U.S. Cl. 52—169.11 16 Claims



11. A foundation system for providing frost-free below-grade basement spaces for modular and mobile manufactured housing units which comprises in combination:

a footing structure formed below basement grade about a space corresponding to the manufactured housing unit to be mounted on the foundation system;

said footing structure including a layer of footing material, a plate member and a plurality of stub wall sections dimensioned so that the top thereof is at basement grade;

a plurality of modular foundation wall units positioned on said stub wall sections sized to extend from basement grade upward above site grade and adapted to receive thereon a housing unit,

said stub all sections and modular foundation wall units being fabricated of material suitable for long term contact with the ground, and

at least one secondary support member having a height substantially equal to the height of said foundation wall unit, fabricated of material suitable for long term contact with the ground;

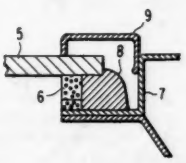
so that mobile and modular housing units may be placed on a foundation by a wheeled trailer unit which can be removed therefrom after erection of sufficient wall units and secondary support members.

5,067,290

DAM RUBBER FOR CAR WINDOW AND ADHERED WINDOW STRUCTURE

Yasuhiro Kuroda, and Hideo Suzuki, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Dec. 29, 1989, Ser. No. 459,237
Claims priority, application Japan, Apr. 14, 1989, 1-96029
Int. Cl.[5] B60R *13/06*; B60J *9/02*
U.S. Cl. 52—208 7 Claims



1. A dam rubber for adhesive fixation of a car window having a spacing function, said dam rubber consisting essentially of:

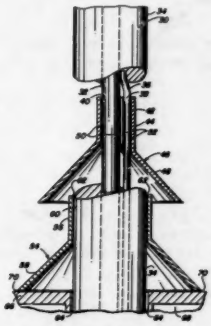
a laminate of at least two highly flexible, gas permeable open cell foamed layers having different compressive resistances that facilitate the escape of air as adhesive is applied to permit smooth hardening of adhesive.

5,067,291

PASS-THROUGH ROOF SEAL SYSTEM

Laurence P. Evensen, 7711 Millwood Ave., Canoga Park, Calif. 91304

Filed Jun. 8, 1990, Ser. No. 534,989
Int. Cl.[5] E04D *13/14*
U.S. Cl. 52—219 5 Claims



1. An improved pass-through roof pipe seal system, said system comprising, in combination:

a) an adapter comprising an inverted funnel having an upstanding vertical upper tube and an integral lower skirt flaring downwardly and outwardly therefrom, said tube and skirt defining a central cavity;

b) an air-conditioning coolant pipe assembly comprising an external, flexible insulated jacket disposed around a pipe, said assembly including a vertical pipe portion from which said jacket has ben cut-away to form a cut-away pipe portion, which pipe portion passes down through said adapter cavity and wherein said pipe is directly sealed to said tube, said skirt covering the lower edge of said cut-away pipe portion for maximum moisture protection;

c) an inverted funnel-shaped vent cup having an upper vertical tube and lower skirt, said cup being secured directly to the outside of said jacket below said adapter, such that said cup is displaced from said coolant pipe by said insulated jacket; and

d) wherein said adapter funnel tube has a pair of spaced vertical openings parallel to each other and extending down to said skirt, wherein said coolant pipe assembly includes a return pipe parallel to said coolant pipe, and wherein said pipes are disposed in and sealed directly to said openings in said tube.

5,067,292

BRACKET SYSTEM

Andrew M. Finean, 37, Brydale House, Rotherhithe New Road, Surrey Docks, London SE16 2PT, United Kingdom

Filed May 19, 1989, Ser. No. 354,620
Claims priority, application United Kingdom, May 19, 1988, 8811833
Int. Cl.[5] E04B *2/88*
U.S. Cl. 52—235 11 Claims

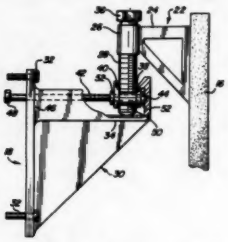
1. A bracket system for positioning and supporting a component on a structure, comprising;

a framework;

at lease one panel;

a plurality of brackets mounted on said framework, said brackets attaching said panel to said framework;

at least one hook connected to said panel, said hook engaging said brackets to support said panel thereon; and



means for three-dimensional adjustment of said panel, said means for adjustment contained in said bracket.

5,067,293

BUILDING SYSTEM

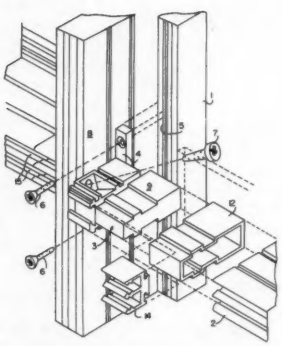
Donald A. Reynolds, Bradford, England, assignor to Don Reynolds International Limited, Bradford, Great Britain

Filed Aug. 9, 1990, Ser. No. 565,376

Claims priority, application United Kingdom, Aug. 16, 1989, 8918707

Int. Cl.[5] E04C *2/40*

U.S. Cl. 52—235 **10 Claims**



1. A curtain wall system, comprising;

a vertical member;

a joint member including means for fastening said joint member to said vertical member and a projection member extending transversely to said vertical member in a horizontal orientation and having bearing surfaces extending horizontally;

a horizontal member of extended length, said horizontal member being contoured in cross-section to slidingly receive and retain said projection member telescopically and at least partially within said horizontal member in the length direction of said horizontal member; and

a low friction layer portioned on the bearing surfaces of said projection member for facilitating sliding motion between said projection member and said horizontal member, said horizontal member and said joint member being subject to relative motion upon thermal expansion or contraction of the horizontal member.

5,067,294

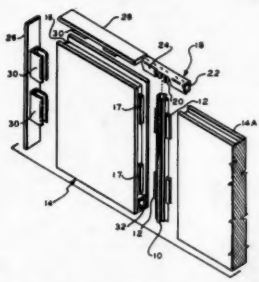
PARTITION ASSEMBLY

Bruce McGowan, 101 Creek Rd., Andover, N.J. 07821

Filed Jul. 30, 1990, Ser. No. 532,622

Int. Cl.[5] E04H *1/00;* **E04B** *2/78*

U.S. Cl. 52—241 **18 Claims**



1. A partition assembly comprising:

a hollow post having an upper open end;

a panel having an exterior facade, an edge recess and a post clip, said post clip being mounted in an intermediate position extending along a predetermined interval of said recess, said interval being separated from the ends of said recess, said post clip being operable to releasably attach to said hollow post by thrusting together said panel and said post without lifting said panel and without removing said exterior facing from said panel, said panel being sized to rest on its bottom without bearing down upon said post; and

a spanner having a central prong sized to fit into said upper open end of said hollow post, said spanner having a pair of panel clips oppositely positioned about said central prong, each of said panel clips being operable to releasably attach to the top of said panel, said panel clips being spaced from said post clip.

5,067,295

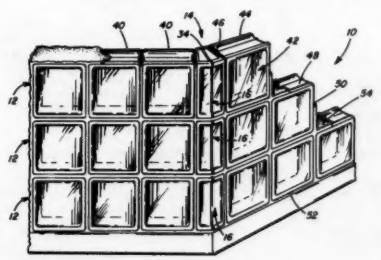
45 DEGREE BLOCK

Charles A. Francik, Murrysville; Harry A. Fleming, Jr., Smethport, both of Pa., and Donald E. Hock, Olean, N.Y., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Sep. 18, 1990, Ser. No. 584,534

Int. Cl.[5] E04B *5/46*

U.S. Cl. 52—306 **17 Claims**



1. A translucent block comprising:

a block having a pair of parallel upper and lower surfaces each having a generally pentagonal shape,

said block having a pair of generally rectangular opposing side faces which are nonparallel, said side faces having a first preselected height and a first preselected width, said side faces being joined to said upper and said lower surfaces and being perpendicular therewith,

said pair of nonparallel side faces having planes formed by the projection of an imaginary line parallel to each said nonparallel side face and the intersection of said imaginary lines forming a 45° dihedral angle,

a generally rectangular, first opposing end wall having said first preselected height and a second preselected width, said first end wall being perpendicular to and joined to said upper and said lower surfaces, said first opposing end wall being joined to said side faces proximal to said 45° dihedral angle formed by said projected planes of said side faces,

a second opposing end wall having said first preselected height and a third preselected width, said second opposing end wall being joined to said upper and said lower surfaces and being perpendicular therewith, said second opposing end wall being joined to said side faces distal from said 45° dihedral angle formed by said projected planes of said side faces,

said second opposing end wall being formed of two generally rectangular equal portions at an obtuse angle to each other,

the vertex of said obtuse angle formed by the juncture of said portions pointing outwardly and away from said dihedral angle,

said block being formed of two identical halves, each said half including one of said pair of side faces, an adjoining half of said first end wall, an adjoining half of said second end wall and an adjoining half of said upper and said lower surfaces.

5,067,296

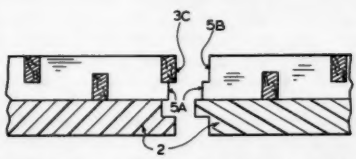
MODULAR INSULATED WALL PANEL SYSTEM

Robert T. K. Brown, 66 East Beach Road, Bowmanville, Ontario, Canada L1C 3K3 , and Ronald W. Smith, 37 Parkway Crescent, Bowmanville, Ontario, Canada L1C 1B9 , assignors to Robert T. K. Brown; Ronald W. Smith, both of Bowmanville and Patrick W. Olive, Unionville, all of, Canada

Filed Jul. 10, 1989, Ser. No. 377,584

Int. Cl.[5] E04C *1/00*

U.S. Cl. 52—309.7 **14 Claims**



1. A panel having two ends and two sides, the panel having a peripheral frame and having at the sides thereof a first surface and a second surface separated by a predetermined distance, the predetermined distance extending from end to end of the panel; the panel having non opposing studs located proximate the first and second surfaces separated by a predetermined distance, said studs of said first surface being offset or staggered laterally a predetermined distance from said studs proximate said second surface; and insulating means having two ends and two sides located proximate the surfaces extending within the peripheral frame between the first and second surfaces with the studs embedded in the surfaces; said insulating means extending to each end of the panel, whereby the panel is rigidified by the lateral staggering of the studs; a joint proximate each end of the panel for interconnecting adjacent panels, the joint comprising some of the insulating means and some of the frame, wherein the side of said stud member extends a predetermined distance beyond the end of the insulating means to form a stepped interlocking joint the joint extending from top to bottom of each panel and ends thereof.

5,067,297

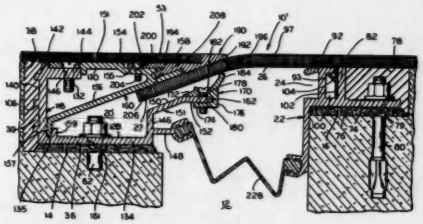
EXPANSION-JOINT COVER ASSEMBLIES

John E. Sobol, Grand Island, N.Y., assignor to Watson Bowman Acme Corp., Grand Island, N.Y.

Filed Nov. 20, 1990, Ser. No. 615,891

Int. Cl.[5] E04F *15/14;* **E04B** *1/60*

U.S. Cl. 52—396 **14 Claims**



1. In an improved expansion-joint cover assembly for a joint formed between first and second adjacent, spaced structural sections comprising:

a first base ember stationarily secured to said first structural section;

a second base member stationarily secured to said second structural section;

a cover member, having a first end secured to said first base member, extending across said joint in a cantilever manner overlying and covering said joint, said cover member having a second end for placement within a passageway formed in said second base member;

said second base member including first and second walls defining said passageway therein for receiving said second end of said cover member in supporting, sliding engagement, the improvement comprising:

an interchangeable trim strip portion removably secured at one end to the end of said first wall defining said passageway, said trim strip portion has a laterally-elongate body portion having an upper horizontal surface and an inclined lower surface, said trim strip portion terminating in a trim piece at a free end distal to the end of said trim strip portion which is removably secured to said first wall; and

means to removably secure said trim strip portion to said first wall defining said passageway.

5,067,298

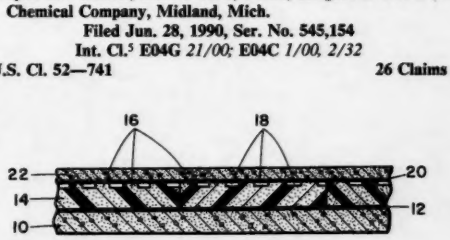
METHOD FOR PLAZA DECK CONSTRUCTION

Wayne E. Petersen, Eden Prairie, Minn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 28, 1990, Ser. No. 545,154

Int. Cl.[5] E04G *21/00;* **E04C** *1/00, 2/32*

U.S. Cl. 52—741 **26 Claims**



1. A method for constructing a plaza deck/parking structure, comprising:

providing a plurality of panels of foam plastic insulation having an alternatively channeled and ribbed surface structure;

providing a porous fabric layer sufficiently porous to permit the passage of water vapor therethrough but not so porous that wet concrete would significantly penetrate therethrough;

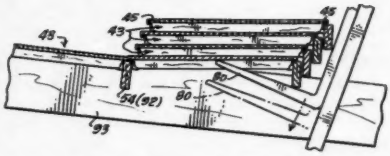
affixing the fabric layer to the top of said ribs on each of said panels;
providing a base deck;
placing a waterproof membrane on top of said base deck;
placing the plurality of panels of foam plastic insulating on top of said waterproof membrane; and
pouring wet concrete on top of the moisture permeable fabric layer and allowing the concrete to cure to a solid layer.

5,067,299

METHOD OF STACKING AND INSTALLING UNITIZED ROOFING SCHEMES

Christopher W. French, 27614 Renwick Ct., Saugus, Calif. 91350

Filed Jul. 31, 1989, Ser. No. 387,693
Int. Cl.[5] E04G *21/14*; E04D *3/34*
U.S. Cl. 52—745 **19 Claims**



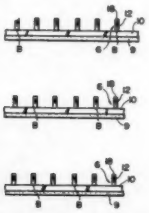
1. A method of stacking a plurality of unitized roofing schemes each of which including a panel assembly fastened to a purlin or the like, comprising
(1) positioning stacking means at a station,
(2) mounting a purlin or the like to said stacking means,
(3) fastening said panel assembly to said purlin or the like and thereby achieving the unitized roofing scheme to be stacked, and
(4) repeating steps (2) and (3) at least once more to thereby achieve another like unitized roofing scheme in a stacked relationship to the first-mentioned scheme.

5,067,300

METHOD OF ATTACHING CURTAIN WALL UNITS TO A BUILDING SKELETON FRAMEWORK

Akihiko Takeda, Tokyo, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 602,510, Oct. 24, 1990, abandoned. This application Apr. 1, 1991, Ser. No. 678,804
Claims priority, application Japan, Oct. 24, 1989, 1-275055
Int. Cl.[5] E04G *21/14*; E04C *2/48*
U.S. Cl. 52—745 **9 Claims**



1. A method of attaching curtain wall units to a building skeleton framework to construct a unit curtain wall, each curtain wall unit including a rectangular frame having at least one oblong pin-guide hole extending longitudinally in a lower edge of the frame, said method comprising the steps of:
(a) attaching a lowermost connecting device and a building-side supporting unit of each of a plurality of connector assemblies to the building skeleton framework at vertically spaced intervals while positioning them relative to the building skeleton framework in a first horizontal direction parallel to a general plane of the unit curtain wall, in a second horizontal direction perpendicular to the general plane of the unit curtain wall, and in a vertical direction, the lowermost connecting device including a first positioning pin extending vertically upwardly and slidably receivable in the pin-guide hole in a lowermost curtain wall unit;
(b) preassembling each curtain wall unit with a frame-side retaining unit of each fastener assembly and also with a positioning plate having a pin-guide cutaway groove by attaching the frame-side retaining unit to an upper edge of the frame of the curtain wall unit and temporarily fastening the positioning plate to the lower edge of the frame, with the pin-guide cutaway groove lying across the pin-guide hole, the frame-side retaining unit including a second positioning pin extending vertically upwardly and slidably receivable in the pin-guide hole in an upper curtain wall unit;
(c) engaging the pin-guide cutaway groove and the pin-guide hole with the first positioning pin to position the lowermost curtain wall unit in said first and second horizontal directions relative to the building skeleton framework, and at the same time, engaging the frame-side retaining unit on the lowermost curtain wall unit with the building-side supporting unit of a lowermost connector assembly to hang a lowermost curtain wall unit on the building skeleton framework, and subsequently firmly joining the frame-side retaining unit and the building-side supporting unit by at least one screw fastener, thereby attaching the lowermost curtain wall unit to the building skeleton framework;
(d) thereafter, engaging the pin-guide cutaway groove and the pin-guide hole in an upper curtain wall unit with the second positioning pin of the lowermost curtain wall unit to position the upper curtain wall unit in the first and second horizontal directions relative to the lowermost curtain wall unit, and at the same time, engaging the frame-side retaining unit of the upper curtain wall unit with the building-side supporting unit of an upper connector assembly to hang the upper curtain wall unit on the building skeleton framework, and subsequently firmly joining the frame-side retaining unit and the building-side supporting unit by at least one screw fastener, thereby attaching the upper curtain wall unit to the building skeleton framework; and
(e) subsequently, repeating the preceding step (d), thereby attaching a row of vertically adjacent curtain wall units successively one above another from the bottom to the top of the row of curtain wall units.

5,067,301

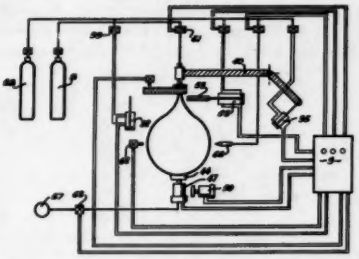
BALLOON INFLATING MACHINE

William P. Shore, Ashfield, Australia, assignor to The Commonwealth Industrial Gases Ltd., St. Leonards, Australia

Filed Aug. 13, 1990, Ser. No. 566,598
Claims priority, application Australia, Aug. 15, 1989, PJ5785
Int. Cl.[5] B65B *31/06, 67/12, 43/36*
U.S. Cl. 53—79 **18 Claims**

1. An apparatus for inflating balloons of the kind having a body and a filling neck terminating in a beaded edge, said apparatus comprising a balloon support plate having a sealing surface and an open ended slot extending from one edge thereof to receive the filling neck of a balloon such that the beaded edge is adjacent said sealing surface and the body of the balloon is disposed on the remote side of the plate; a filling head selectively moveable toward said sealing surface to clamp said beaded edge between the filling head and sealing surface

and establish a substantially gas tight seal between the filling head and beaded edge; and a pressurised gas flow passage



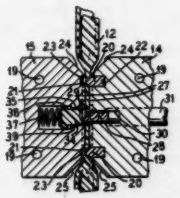
through said filling head to the neck of a clamped balloon for inflation of the balloon.

5,067,302

SEALING JAWS FOR ZIPPERED FOIL OR FILM IN FORM, FILL AND SEAL MACHINES

Hugo Boeckmann, Arlington Heights, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Jan. 26, 1990, Ser. No. 470,803
Int. Cl.[5] B65B *51/30*
U.S. Cl. 53—374.8 **4 Claims**



1. A sealing jaw structure for simultaneously sealing adjacent tubular bags sealing the trailing end of one bag and the leading end of another comprising in combination:

first and second cooperating sealing jaws for receiving multilayered tubular thermoplastic bag material therebetween and being reciprocal to move together to a clamping sealing position and apart to a spread position;

means for heating each of said jaws;

a laterally extending heated upper and a laterally extended heated lower extruding rib projecting from a face of the first jaw a predetermined distance and located respectively at the upper and lower edges of the jaw to form lateral seals across the bag material;

laterally extending upper and lower heated grooves in the second jaw corresponding in position with the ribs, each of said extruding ribs having a depth so that said ribs do not completely extend into said grooves when said jaws are in said clamping position, so that thermoplastic material is extruded into said grooves by the ribs;

a knife member located between said ribs for cutting the material of the bags when the jaws are in said clamping position;

said ribs and said grooves heated by said heating means for simultaneously anchoring said thermoplastic material during cutting by said knife member and for forming an extruded seal of the thermoplastic material extruded into the grooves by the ribs; and

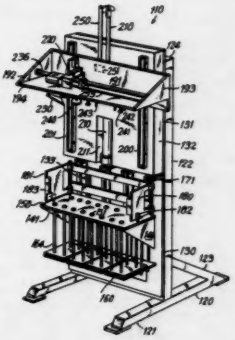
a heated sealing face in each jaw located on each side of the knife between the knife and the ribs with said faces forming respective further seal continuous with the respective extruded seals at the ends of the bags with the extruded seal formed by the ribs being inwardly from the seal formed by said face.

5,067,303

AUTOMATED BOX BLANK HANDLING SYSTEM

Donald L. Brookman, Richmond; Everett C. Grollimund; Gary E. Grollimund, both of Midlothian, and Steven F. Spiers, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 19, 1990, Ser. No. 600,437
Int. Cl.[5] B65B *69/00, 43/39*
U.S. Cl. 53—381.2 **16 Claims**



11. The machine of claim 9, wherein said means for opening the upper flaps of said shipping case comprises:

a) a hood slideably mounted on said frame above said support plate;

b) means for moving said hood from a first position adjacent the top of said shipping case to a second position remote from the top of said shipping case;

c) a pair of suction cups mounted on the underside of said hood;

d) a plurality of holddown bars mounted on said hood;

e) cutting means located on the underside of said hood for opening the upper flaps of said shipping case;

f) means for inducing a vacuum in said suction cups so that said cutting means can open said upper flaps of said shipping case; and

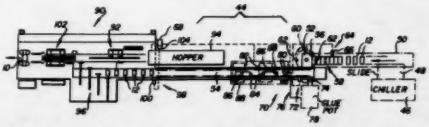
g) means for urging said holddown bars through said apertures in the top of said shipping case against said upper insert while said cutting means opens the upper flaps of said shipping case.

5,067,304

PACKAGING WITH UTENSIL

David F. Kuethe, Madison, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 12, 1991, Ser. No. 653,914
Int. Cl.[5] B65B *61/00*
U.S. Cl. 53—410 **15 Claims**



10. A continuous and automatic method for packing a container with a utensil applied thereto in a carton to form a finished package comprising the steps of:

transferring containers travelling along an infeed conveyor to a flighted belt, including the step of sensing the pres-

ence of a backlog of containers at a transferring means and enabling the transferring means when the backlog is sensed;

applying a respective wrapped utensil to a surface of each container passing along on the flighted belt, including the step of sensing a presence of each successive container on the flighted belt;

matching a selected line speed of the containers on the flighted belt with a transferring speed of the transferring means;

placing each successive container with a utensil applied thereto in a carton; and

closing each carton about the container to form the finished package.

5,067,305

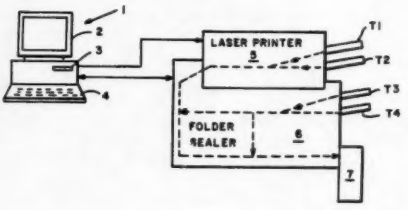
SYSTEM AND METHOD FOR CONTROLLING AN APPARATUS TO PRODUCE MAIL PIECES IN NON-STANDARD CONFIGURATIONS

Walter J. Baker, 378 N. Abram St., Stratford, Conn. 06497, and Christopher S. Riello, 2838 Whitney Ave. #14, Hamden, Conn. 06518

Filed Mar. 12, 1990, Ser. No. 491,871

Int. Cl.[5] B65B *57/16, 61/02*

U.S. Cl. 53—411 **5 Claims**



1. Apparatus for preparing a mail piece, comprising:

a) input means for input of information defining a mail piece configuration;

b) a printer for printing text on at least a sheet and an address on an associated envelope form;

c) sheet processing means for receiving at least said sheet and said envelope form from said printer and for accumulating at least said sheet and said envelope form, folding said accumulated sheet and envelope form and then sealing said envelope form to form said mail pieces, said sheet processing means having a capacity to process mail pieces having a predetermined maximum value of a parameter, said parameter defining the number of sheets in said mail pieces;

d) diverting means for selectively diverting sheets and envelope forms output by said printer from input to said sheet processing means; and

e) control means responsive to said input means for:

e1) determining the value of said parameter in accordance with said defining information; and,

e2) if the value of said parameter is less than said maximum value, controlling said sheet.

5,067,306

PROCESS AND APPARATUS FOR PROCESSING EASY-OPENING BAG

Kazumi Umezawa, Tokyo, Japan, assignor to Asahi Chemical Polyflex Co., Ltd., Tokyo, Japan

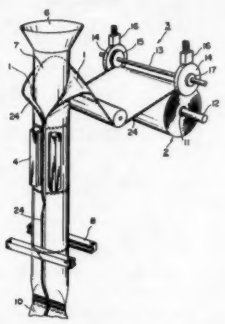
Filed Jun. 1, 1990, Ser. No. 531,996

Claims priority, application Japan, Jun. 2, 1989, 1-139075

Int. Cl.[5] B65B *61/18*

U.S. Cl. 53—412 **20 Claims**

1. In a process for producing a sealed and packed bag by means of an automatic bag-making packer, a process for providing easy-opening of the sealed and packed bag comprising pressing on each outermost side margin of an outermost turn of a roll of film a cylindrical surface of a respective one of a pair of cutting rollers of the automatic bag-making packer, the cylindrical surface of each said cutting roller having multiple edged projections, to form microcuts in said outermost side margins with said edged projections so that a subsequently packed and heat-sealed bag is easily opened from heat-sealed



outermost side margins of the sealed and packed bag having said microcuts therein without reducing mechanical strength of a film consituting the sealed and packed bag, and positioning an inner side surface of each of a pair of positioning rollers against respective side surfaces of said roll of film, including said outermost turn, and against respective outer side surfaces of said cutting rollers to prevent transverse movement of said roll of film during said pressing.

5,067,307

METHOD AND APPARATUS FOR CONTROLLING THE ADVANCE OF A WRAPPING FILM

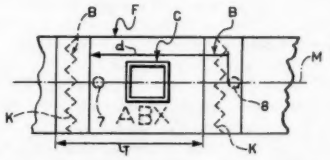
Renzo Francioni, Prato Sesia, and Duilio Pavese, Borgosesia, both of Italy, assignors to Cavanna S.p.A., Italy

Filed Dec. 28, 1990, Ser. No. 635,864

Claims priority, application Italy, Dec. 29, 1989, 68192 A/89

Int. Cl.[5] B65B *41/18, 57/04, 9/20*

U.S. Cl. 53—450 **10 Claims**



1. A method of detecting, by optical means, the positions of reference marks reproduced at given intervals on a film for wrapping products advancing in a given direction in a wrapping machine, in which further marks which can be detected by the optical means are reproduced at the said intervals of the film with said reference marks having a length greater than a length of said further marks, the method including the steps of:

providing at least first and second optical detection units disposed one upstream of the other in the direction of advance of the film and separated by a distance which differs at least slightly from the said given intervals, in order to generate first and second signals relating to the passage of the marks in correspondence with the first and second optical detection units respectively, and

generating a locating signal when the first and second detection signals are present simultaneously so that the locating signal is indicative of the positions of the reference marks but is substantially unaffected by the presence of the further marks;

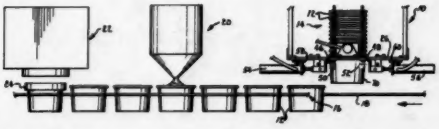
wherein the said distance differs from the given interval by a value between the lengths of the further marks and the lengths of the reference marks, the lengths being measured in the direction of advance of the film.

5,067,308

MECHANISM AND METHOD FOR SUPPORTING AND INDIVIDUAL DISPENSING OF NESTED CONTAINERS

Larry K. Ward, Kansas City, Mo., assignor to Sealright Co., Inc., Mo.

Filed Jan. 8, 1990, Ser. No. 462,138
Int. Cl.[5] B65B *3/04*
U.S. Cl. 53—471 **21 Claims**



15. A process for supporting a nested container stack and dispensing individual containers from the stack, said processing comprising the steps of:

(a) supporting a lowermost container in the nested container stack on a lower support plate which is movable between support and released positions;

(b) supporting the remainder of the nested container stack on an upper support plate which is movable between support and released positions;

(c) moving the lower support plate to the released position to release the lowermost container, thereby activating a thrusting finger

(d) returning the lower support plate to the support position;

(e) moving the upper support plate to exert a downward force on the released container and thus dispense the released container to the released position to permit downward indexing of the container stack and then returning the upper support plate to the support position when the lowermost container remaining in the container stack descends into engagement with the lower supper plate; and

(f) then repeating steps (a) through (e) to dispense additional containers from the nested container stack.

5,067,309

APPARATUS FOR CUTTING AND ASSEMBLING BATCHES OF DIAGNOSTIC STRIPS FOR TRANSFER TO CONTAINERS

David L. Carlberg, Sonora; Theodore V. Meigs, Jr., and Dennis L. May, both of Twain Harte, all of Calif., assignors to Kinematic Corporation, Sonora, Calif.

Filed Jun. 29, 1990, Ser. No. 545,633
Int. Cl.[5] B26D *7/06*; A21C *15/04*; B65B *63/00*
U.S. Cl. 53—520 **18 Claims**

1. Apparatus for cutting cards into a plurality of strips and for assembling batches of the strips for transfer into containers, comprising:

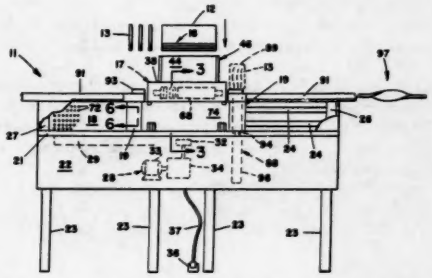
a rotary knife set having a first plurality of spaced apart cutting disks aligned along a first axis of rotation and a second plurality of spaced apart cutting disks aligned along a second parallel axis of rotation, said disks being positioned to cut cards which pass between said axes of rotation into a plurality of strips,

a strip carrier extending in parallel relationship with said axes of rotation, said carrier having spaced apart strip receiving slots on first and second sides thereof,

means for directing alternate ones of the strips that are cut from each card into said slots at said first side of said carrier and for directing the others of said strips that are cut from the card into said slots at said second side of said carrier,

at least a first and a second strip collector each having an interior chamber and a strip receiving passage communicated therewith,

means for enabling relative movement of said carrier and said strip collectors to bring successive ones of said strips



in said slots at said first side of said carrier to said first collector and to bring successive ones of said strips in said slots at said second side of said carrier to said second collector,

means for transferring said strips from said carrier to said first and second collectors as said strips arrive thereat and

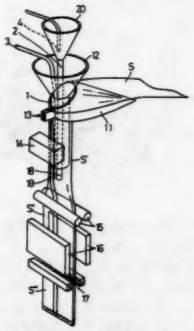
means for transferring batches of said strips from said collectors to said containers.

5,067,310

RAW MATERIAL SUPPLY DEVICE AT A STOW-PACKAGING MACHINE

Mitsuaki Yamanaka, Koshigaya, Japan, assignor to Chuo Packaging Machinery Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1990, Ser. No. 574,089
Int. Cl.[5] B65B *9/06*
U.S. Cl. 53—551 **4 Claims**



1. In a material packaging machine having means for feeding film or sheet material continuously around a guide tube and forming a tubular packaging member having side edges and a longitudinal axis extending substantially in the feeding direction, said guide tube having upper and lower ends, means for sealing the side edges in the feeding direction, means for sealing the tubular member in a direction transverse to the longitudinal axis intermittently at first and second spaced positions to provide a sealed package for containing contents therein, said second position being above said first position and sealed after sealing said first position, the improvement comprising:

a liquid supply tube disposed in said guide tube for supplying liquid material into said tubular packaging member

through said guide tube after sealing at said first position and before sealing at said second position;

said liquid supply tube having a lower end terminating below said lower end of said guide tube;

a solid material supply tube disposed in said guide tube and having an upper end for supplying solid pulverulent material soluble in said liquid material into said tubular packaging member through said guide tube simultaneously with said liquid material;

said solid material supply tube having a lower end at substantially the level of said lower end of said liquid supply tube; and

a blast pipe within said solid material supply tube for supplying dry gaseous material into said solid material supply tube for preventing said solid material from being moisturized prior to mixing with said liquid in said tubular packaging member.

5,067,311

APPARATUS FOR FORMING PACKAGING MATERIAL INTO A TUBE

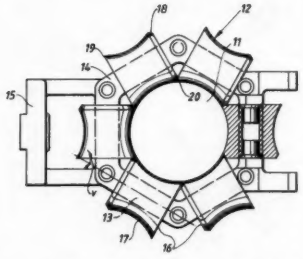
Helge Andersson, Lund, Sweden, assignor to Tetra Pak Holdings S.A., Pully, Switzerland

Filed Oct. 30, 1990, Ser. No. 605,408

Claims priority, application Sweden, Nov. 7, 1989, 8903718

Int. Cl.[5] B65B *9/06*

U.S. Cl. 53—551 **16 Claims**



1. An apparatus for forming a web of packaging material into a hollow configuration comprising: a plurality of forming rollers arranged adjacent to one another to define a material aperture therebetween through which the web is to be conveyed in order to be formed into a hollow configuration, each of said forming rollers having a longitudinal axis and oppositely positioned end surfaces extending substantially radially of said longitudinal axis, each of said forming rollers also having a working surface disposed between the end surfaces and a roller edge positioned between the working surface and each end surface, at least one pair of adjacent forming rollers including a first forming roller having one roller edge in which the working surface and one end surface are separated by a chamfered portion and a second forming roller having one roller edge in which the working surface and one end surface intersect directly, the first forming roller being positioned with respect to the second forming roller such that the chamfered portion of the first forming roller faces said one end surface of the second forming roller.

5,067,312

PROCESS AND DEVICE FOR PACKING OBJECTS IN STRETCH FILM

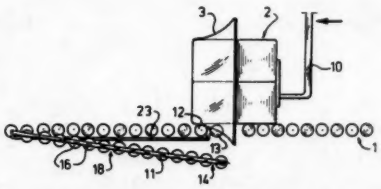
Dick Van Dijk, Ermelo, Netherlands, assignor to Apollo B.V., Nijkerk, Netherlands

Filed Nov. 29, 1990, Ser. No. 619,410

Claims priority, application Netherlands, Dec. 5, 1989, 8902994

Int. Cl.[5] B65B *11/08*

U.S. Cl. 53—556 **6 Claims**



1. In a device for packaging objects in stretch film, provided with a horizontal conveyor track for conveyance of the objects to be packed, feed and tensioning means for the film disposed on either longitudinal side of said track for feeding the film in a vertical plane across the track so that as said object is moved into the film the front side and the two longitudinal sides are wrapped by the film, and means for fitting, welding and cutting the film on the rear side of the objects; the improvement in which the film intersects the supporting face of the conveyor track and extends below said track, the conveyor track at least partially is of a width which is smaller than that of the objects to be packed, in such a way that the latter project at the longitudinal sides relative to said conveyor track and that the part of the film situated below said supporting face can wrap around the bottom longitudinal edges against and on the edge areas of the bottom side of the objects to be packed, a transverse part of the conveyor track having transverse section downstream of said plane which in the direction of conveyance of the objects connects directly to the plane where the film intersects said conveyor track and is movably mounted relative to said track, and means for moving said transverse section out of the conveyor track after the weld is cut, so that a space is formed in said track adjacent said plane in which space the film projecting below said track wraps around the rear, bottom transvese edge of the objects against and on said edge area.

5,067,313

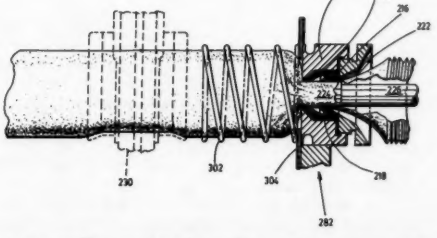
PACKAGING DEVICE WITH LOOP ATTACHMENT MECHANISM AND SKIN BRAKE

Alfred J. Evans, Raleigh, N.C., assignor to Delaware Capital Formation, Inc., Apex, N.C.

Filed May 18, 1990, Ser. No. 526,060

Int. Cl.[5] B65B *43/42, 51/05, 61/14*

U.S. Cl. 53—576 **3 Claims**



1. In a stuffing machine for stuffing comminuted material in

casing to form chubs, the machine comprising a stuffing horn means for the passage of comminuted material and for the provision of casing, and further comprising casing brake means for controlling casing withdrawal from the horn means in relation to the exiting of comminuted material from the horn means, the improvement comprising:

a product support comprising a helical spring mounted adjacent the discharge end of the casing brake means defining and extending along the path of the stuffed casing, the spring, having a diameter sized to permit the spring to surround the stuffed casing exiting the casing brake means and having a lateral strength to support the stuffed casing.

5,067,314

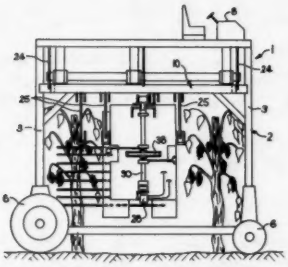
HARVESTER FOR GRAPES

Desmond C. Burke, Mildura, Australia, assignor to U.R. Engineering Pty., Ltd., Mildura, Australia

Continuation of Ser. No. 552,429, Jul. 13, 1990, abandoned, which is a continuation of Ser. No. 361,173, Jun. 5, 1989, abandoned. This application Apr. 18, 1991, Ser. No. 687,201

Int. Cl.[5] **A01D** *46/00*

U.S. Cl. 56—330 **11 Claims**



1. A harvesting machine suitable for grapes and like crops, the harvesting machine comprising a mobile carriage having a picking head operatively connected thereto, said picking head including a main frame which is operatively connected to said carriage, said main frame having an axis which extends generally in the same direction as the normal line of travel of the harvesting machine, picking means operatively connected to said main frame, said picking means comprising a plurality of picking rods which are movable back and forth laterally of said axis of said main frame, said picking rods being arranged in banks with at least one bank being disposed on one side of said main frame axis, and at least one other of said banks being disposed on the other side of said main frame axis, said rods in each bank being arranged side by side in spaced apart in relation to a longitudinal axis extending between one end of the bank to the other end, said banks of picking rods being pivotally mounted with respect to said main frame of said picking head about pivot axes which extend generally parallel to the main frame axis so that said banks of picking rods can adopt an operating mode in which the banks of picking rods are freely pivotable about the pivot axes so that, in use, the banks can change position as the harvester moves along the row of vines and wherein said main frame of said picking head is mounted so as to be suspended from said carriage and freely pivotable relative thereto about an axis which extends generally parallel to the main frame axis.

5,067,315

PROCESS FOR SPLICING THE ENDS OF TWO DOUBLE YARNS

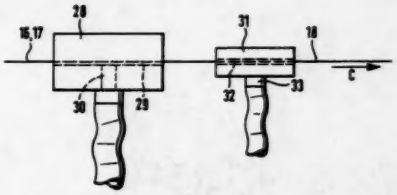
Fritz Stahlecker, Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Continuation of Ser. No. 365,841, Jun. 15, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 614,677

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 3821570

Int. Cl.[5] **D01H** *1/115, 15/00*

U.S. Cl. 57—22 **9 Claims**



1. A process for splicing the ends of two double yarns during a piecing operation at a spinning unit of the type which spins two yarns which are guided together to form the double yarn and, as the double yarn, are wound onto a spool which serves as a feeding package for subsequent twisting, said process comprising:

preparing the yarn ends to be spliced by reducing their fiber quantity level below the fiber quantity level of normally spun yarn,

and splicing the yarn ends to form a spliced section which has less fibers per cross-section than overlapping sections of normally spun yarn,

thereby forming an intentionally weaker thin spliced section to be subsequently twisted,

wherein said reducing of their fiber quantity includes reducing their fiber quantity to less than half their normally spun fiber quantity, thereby assuring that the spliced section has less fiber per cross-section than normally spun yarn.

5,067,316

ROCKET ENGINE EXPANSION NOZZLE WITH COMPLEMENTARY ANNULAR NOZZLE

Claude E. Bonniot, Gisors, France, assignor to Societe Europeene De Propulsion, Suresnes, France

Filed Nov. 16, 1989, Ser. No. 437,201

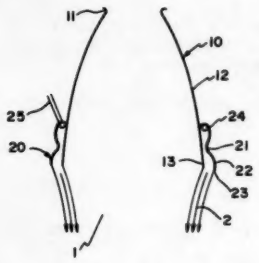
Claims priority, application France, Nov. 21, 1988, 88 15122

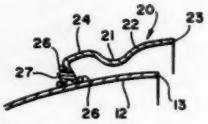
Int. Cl.[5] **F02K** *11/00;* **B63H** *25/46*

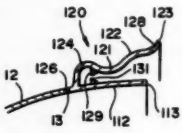
U.S. Cl. 60—263 **30 Claims**

1. An expansion nozzle for a rocket engine destined to function successively in atmospheric and space conditions, comprising a main wall defining a surface of revolution that splays outwardly between a nozzle throat and a downstream extremity of said expansion nozzle, wherein said expansion nozzle further comprises a complementary annular convergent and divergent nozzle of small vertical extent having an exhaust port as well as an axis coinciding with a principal axis of said main wall, said complementary annular nozzle along with the exhaust port being located outside said main wall in the region of said downstream extremity of said expansion nozzle and having a gas distribution torus cooperating with gas flow supply means to produce an annular flow of gas exhausted from the diverging part of said complementary annular nozzle, said annular flow of gas surrounding a main flow of gas exhausted at said downstream extremity of said main wall of said

expansion nozzle and forming a source of static pressure Ps that is substantially lower than atmospheric pressure Pa and Ps







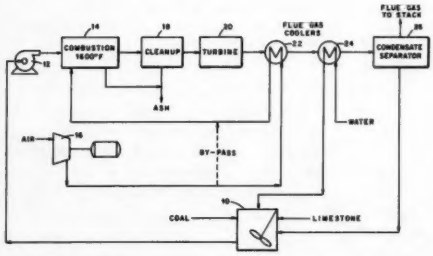
having a value of between 0.3 and 0.8 times atmospheric pressure Pa.

5,067,317

PROCESS FOR GENERATING ELECTRICITY IN A PRESSURIZED FLUIDIZED-BED COMBUSTOR SYSTEM

Stanley Kasper, Pittsburgh, Pa., assignor to The United States of America as represented by the United State Department of Energy, Washington, D.C.

Filed Feb. 26, 1990, Ser. No. 484,303
Int. Cl.[5] F02C *3/26*
U.S. Cl. 60—39.05 **11 Claims**



1. A method of generating electric power from coal using a pressurized fluidized-bed combustor system, the method comprising the steps of:

(a) supplying coal in a feed slurry comprising water, coal and a sulfur sorbent to a combustor;

(b) combusting the coal with air in a pressurized combustor chamber in the combustor to produce a flue gas;

(c) controlling the combustor temperature by varying an amount of excess air and water supplied to the combustor, whereby increasing the excess air and water reduces the combustor operating temperature;

(d) allowing the flue gas to expand through a turbine to generate electric power, and

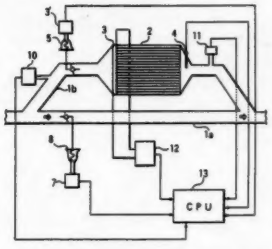
(e) cooling the flue gas, after exiting from the turbine, by heat exchange with a system fluid whereafter spent gas is outputted at the atmosphere and liquid condensed from the flue gas is returned to the feed slurry.

5,067,318

REGENERATION SYSTEM FOR PARTICULATE TRAP

Minoru Arai, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed May 17, 1990, Ser. No. 524,466
Claims priority, application Japan, Jun. 16, 1989, 1-153935
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—286 **8 Claims**



1. A regeneration system for a particulate trap (2) provided in an exhaust pipe (1) of an engine comprising;

means (10, 11) for sensing the pressure loss across said trap (2),

means (4) for sensing the temperature of said trap (2), and

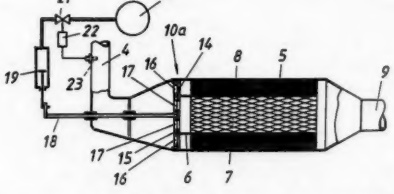
control means (13) for initiating the regeneration when said pressure loss has reached a preset value, and then for renewing said preset value when the peak value of said temperature through the regeneration resides outside a predetermined range, the initial value of said preset value being determined on the basis of the minimum value within the variation of the pressure loss of cleaned traps.

5,067,319

SYSTEM FOR PURIFYING THE EXHAUST GASES OF DIESEL ENGINES

Franz Moser, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 13, 1990, Ser. No. 479,374
Claims priority, application Austria, Feb. 15, 1989, 334/89
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—288 **7 Claims**



1. A system for purifying exhaust gas of a diesel engine, comprising

an exhaust line,

two branch lines comprising a filter line and a by-pass line,

respectively, and arranged downstream of said exhaust line,

a soot filter incorporated in said filter line,

a common end line, which is connected to said filter line downstream of said soot filter and to said by-pass line,

change-over valve means, for connecting said exhaust line in alternation only to said filter line and only to said by-pass line,

valve-actuating means, for operating said change-over valve means in dependence on the load on said engine so that they connect said exhaust line only to said filter line when said engine is operating under a load in excess of a predetermined load, which is lower than its full load, and so that they connect said exhaust line only to said by-pass line when said engine is operating under a load which is not in excess of said predetermined load,

an oxidation-inducing catalyst for diesel soot downstream of said change-over valve means and incorporated in one of said by-pass or common end lines, and

heat-conductive means for interconnecting said soot filter and said oxidation-inducing catalyst.

5,067,320

EXHAUST PARTICLE REMOVING SYSTEM FOR INTERNAL COMBUSTION ENGINE

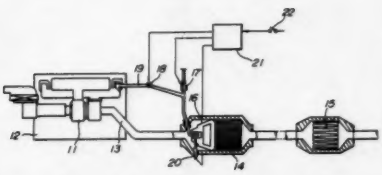
Nobukazu Kanesaki, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jan. 22, 1990, Ser. No. 467,397

Claims priority, application Japan, Jan. 24, 1989, 1-13155

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—297 **6 Claims**



1. An exhaust particle removing system for an engine, comprising:

a first filer disposed in an engine exhaust passage for trapping particles unopened in exhaust gas;

combustion means disposed near the inlet of the first filter for burning off particles deposited on the first filter; and

a second filer, disposed in the engine exhaust passage downstream of the fist filter in series therewith for trapping particles suspended in exhaust gas passing through the first filter, said second filter being coated with a catalyst and separate from the first filer by a predetermined distance so that h particles deposited on the second filter are burned off by means of an elevated temperature of gas passing through the first filter.

5,067,321

HYDRAULIC HOISTING CIRCUIT WITH ELECTRICAL CONTROL FOR RELIEF VALVE ADJUSTMENT PILOT AND PILOT DISABLE VALVE

Satoshi Miyaoka, Hiroshima, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 14, 1990, Ser. No. 480,145

Claims priority, application Japan, Feb. 23, 1989, 1-44839

Int. Cl.[5] E02F *3/32, 9/20, 9/22;* **F15B** *11/02*

U.S. Cl. 60—426 **3 Claims**

2. A hydraulic circuit comprising:

a main pump;

a plurality of hydraulic selector valves adapted to be supplied with a discharge pressure oil from said main pump;

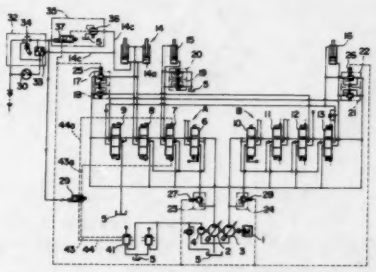
a plurality of actuators for operating a plurality of working devices;

a main relief valve for relieving the discharge pressure from said main pump when the discharge pressure exceeds a predetermined pressure;

a plurality of port relief valves for preventing pressures in lines connected to said actuators from becoming higher than a predetermined pressure;

boost receiving means associated with said main relief valve and with at least one of said port relief valves;

a hydraulic signal generating means for supplying a hydraulic signal to said boost receiving means for boosting set pressures of said main relief valve and said at least one of said port relief valves;



an operation suppressing means for maintaining a specific one of said plurality of hydraulic selector valves in a neutral position when said set pressures are boosted;

an electrical control switch arbitrarily controllable by an operator for simultaneously sending an electrical control signal to said hydraulic signal generating means and to said operation suppressing means to simultaneously boost said set pressures and maintain said specific one of said hydraulic selector valves in a neutral position; and

a retaining circuit containing a pressure switch, said pressure switch closing in response to a predetermined pressure in a hydraulic line of said hydraulic circuit to prevent elimination of a boosted condition of said set pressures if said engine stops or if said electrical control switch is opened before the pressure in said hydraulic line drops below said predetermined pressure.

5,067,322

REFRIGERATOR WITH SPINE FIN EVAPORATOR

David G. Beers, Evansville, Ind., assignor to General Electric Company, Louisville, Ky.

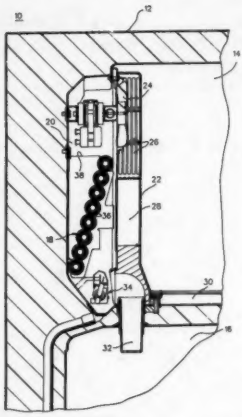
Filed Oct. 5, 1990, Ser. No. 593,750

Int. Cl.[5] F25B *39/02*

U.S. Cl. 62—515 **12 Claims**

1. A refrigerator having at least one compartment to be refrigerated and a refrigerant evaporator normally operable to refrigerate said at least one compartment; said evaporator

including an elongated evaporator tube to receive refrigerant and an elongated ribbon of spine fin material wound in an open



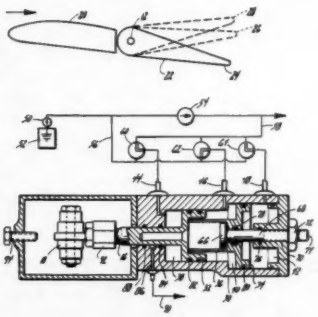
spiral about the outer surface of said tube and in intimate heat transfer relationship with said outer surface of said tube.

5,067,323

THREE POSITION ACTUATOR ARRANGEMENT

Keith N. Bennett, West Palm Beach, and Richard H. Pangretic, Jr., Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 13, 1990, Ser. No. 537,965
Int. Cl.[5] F02C *1/00*; F01B *7/02*
U.S. Cl. 60—734 **7 Claims**



1. A three position actuator arrangement for use in an aircraft gas turbine engine comprising:

a cylindrical housing;

a first small diameter piston having a drive shaft slideably passing through said housing;

a second large diameter piston;

said first and second pistons abutable with lost motion spacing therebetween;

said pistons and housing defining axially spaced chambers comprising a first chamber between one end of said housing and said first piston, a second central chamber between said first and second pistons, and a third chamber between said second piston and the other end of said housing;

a first conduit in fluid communication with said first chamber;

a second conduit in fluid communication with said second chamber;

a third conduit in fluid communication with said third chamber;

a high pressure fluid source;

a low pressure fluid sink;

selection means for selectively connecting each of said chambers with said source and sink; and

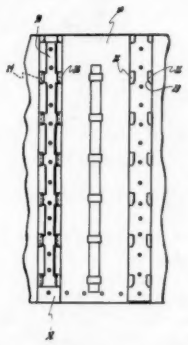
an adjustable stop rod adjustably secured to said housing adjacent said third chamber, slideably and sealingly passing through said second large diameter piston, and having a radial extension within said second chamber abutable with said second larger piston.

5,067,324

ENGINE NOZZLE LINER RETAINER

Deane Beytes, Tequesta, and Erik A. Lindstrom, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 4, 1990, Ser. No. 504,230
Int. Cl.[5] F02C *1/00*
U.S. Cl. 60—752 **5 Claims**



1. A liner retaining arrangement for retaining a nozzle liner against a nozzle wall comprising:

a flexible liner having a plurality of arcuate sections and axially extending linear portions located between said arcuate portions;

a planar impingement plate;

a plurality of axially slideable interlocking clip pairs, a first clip of each pair secured to said linear portion and a second clip of each pair secured to said impingement plate, said clip pairs each having a length and spacing between pairs such that said liner may be placed with said clip pairs clearing each other and axially slid into engagement;

at least one axial retaining structure comprising;

a fixed stop in one of said liner and impingement plate abutable with a clip on the other of said liner and impingement plate in a first direction;

a depressible spring on one of said liner and impingement plate abutable with a clip on the other of said liner and impingement plate on the second direction when the spring is in its undepressed condition, but not when it is in its depressed condition.

5,067,325

METHOD AND ARRANGEMENT FOR PUMPING REFRIGERANTS

Jan-Olov L. Åhman, Norrtälje, Sweden, assignor to Clas Ove Olsson, Norrtalje, Sweden

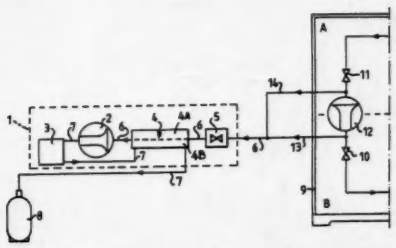
PCT No. PCT/SE89/00029, § 371 Date Jul. 24, 1990, § 102(e) Date Jul. 24, 1990, PCT Pub. No. WO89/07227, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 27, 1989, Ser. No. 543,809

Claims priority, application Sweden, Jan. 28, 1988, 8800282

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—77 12 Claims



1. A method of recovering refrigerant from a system comprising

feeding refrigerant from a system in liquid or gaseous state to a pressure reduction valve,

expanding the refrigerant in said valve,

passing the refrigerant through a heat exchanger,

heating the refrigerant in said heat exchanger such that when the refrigerant is discharged from the heat exchanger, the refrigerant is in a gaseous state,

compressing the refrigerant in gaseous state in a compressor,

passing the refrigerant from the compressor through said heat exchanger in counterflow with the refrigerant passing through the heat exchanger from the pressure reduction valve,

transferring heat from the refrigerant passing through the heat exchanger from the compressor to the refrigerant passing through the heat exchanger from the pressure reduction valve to cool the refrigerant from the compressor and heat the refrigerant from the pressure reduction valve, and

discharging the refrigerant from the heat exchanger which came from the compressor.

5,067,326

METHOD AND APPARATUS FOR CONTROLLING CAPACITY OF A MULTIPLE-STAGE COOLING SYSTEM

Richard H. Alsenz, 2402 Creekmeadows Dr., Missouri City, Tex. 77459

Division of Ser. No. 146,285, Jan. 21, 1988, Pat. No. 4,951,475, which is a continuation-in-part of Ser. No. 62,390, Jun. 15, 1987, Pat. No. 4,825,662, which is a continuation of Ser. No. 819,387, Jan. 16, 1986, which is a continuation-in-part of Ser. No. 706,403, Feb. 27, 1985, Pat. No. 4,628,700, which is a continuation of Ser. No. 458,914, Jan. 18, 1983, abandoned, which is a continuation of Ser. No. 257,113, Apr. 24, 1981, Pat. No. 4,612,776, which is a continuation of Ser. No. 62,525, Jul. 31, 1979, abandoned. This application Aug. 23, 1990, Ser. No. 571,746

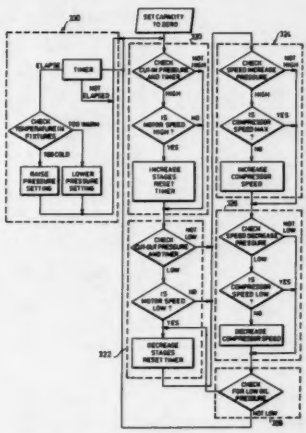
Int. Cl.[5] F25B *31/00;* F04B *49/10*

U.S. Cl. 62—193 13 Claims

1. Apparatus for controlling the capacity of a refrigeration system having a variable speed compressor, said compressor having an associated suction pressure and a minimum operating oil pressure, said compressor being adapted to operate at variable speeds between a maximum and a minimum speed, said system coprising:

(a) pressure selecting means for establishing an operating suction pressure range;

(b) pressure detection means for sensing the suction pressure and for cooperating with said pressure selecting means to generate a first increase speed signal when said suction pressure exceeds the pressure range, and to generate a decrease speed signal when said suction pressure falls below the pressure range;



(c) oil pressure detection means for providing a second increase speed signal when said oil pressure falls below said minimum operating oil pressure; and

(d) selection means for receiving said first and second increase speed signals and causing the speed of the compressor to increase in respective response thereto, and for receiving the decrease speed signal and causing the speed of the compressor to decrease in response thereto.

5,067,327

REFRIGERANT RECOVERY AND RECHARGING DEVICE

Charles B. Leblanc, Cocagne, Canada, assignor to Enspeco Inc., Cocagne, Canada

Filed Sep. 18, 1990, Ser. No. 584,073

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—292 10 Claims

1. A device for recovering refrigerant from a refrigeration circuit, comprising:

inlet means for connection to a refrigeration circuit;

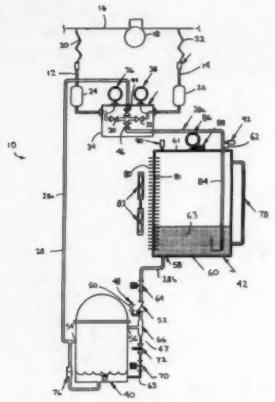
an activatable compressor having a low pressure inlet and a high pressure outlet, said inlet of said compressor connected to said inlet means;

a tank means, for functioning as a refrigerant condenser and storage means, having heat conducting walls and having an inlet through a bottom wall thereof, said tank means constructed so that any liquid in said tank means fills said tank from the bottom thereof, said tank means inlet connected to said outlet of said compressor;

activatable means to cool the walls of said tank means; and

a valve means connected between said compressor inlet and said inlet means; whereby said device may be coupled to a refrigeration circuit, said valve means opened and said compressor and cooling means activated whereupon refrigerant vapour is drawn from said refrigeration circuit and is pushed through said tank means inlet into said tank means, said refrigerant vapour condensing on contacting the walls of said tank means and the resultant liquid refrig-

erant collecting at the bottom of said tank means such that refrigerant vapour entering said tank means inlet bubbles



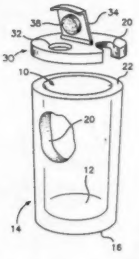
through any collected liquid refrigerant and is thereby cooled.

5,067,328

COOLING VESSEL FOR BEVERAGES

Victor Medina, and Rebecca Medina, both of 1300 N. 10th St., Poplar Bluff, Mo. 63901

Filed Jul. 12, 1989, Ser. No. 378,653
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—457.2 **3 Claims**



1. A cooling vessel for beverages comprising:

a cylindrical member having an open top and a bottom wall that closes its bottom end, said cylindrical members having a predetermined outer diameter and a predetermined height;

an outer tubular member having a bottom wall, said outer tubular member having a height greater than that of said cylindrical member and an inner diameter greater than the outer diameter of said cylindrical member so that said cylindrical member can be inserted into said outer tubular member and be spaced from its respective walls thus forming a chamber surrounding the side walls and bottom wall of said cylindrical member;

a refrigerant filling said chamber between said cylindrical member and said outer tubular member, said refrigerant being a freezable gelatin such as blue ice;

an annular top wall connecting the top edge of said outer tubular member and the top edge of said cylindrical member; and

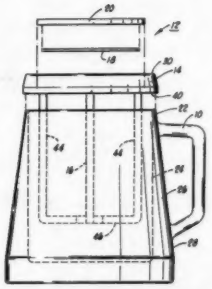
a removable lid having a top surface spaced upwardly from a bottom surface to form a chamber that is filled with a freezable gelatin such as blue ice, said removable lid having a vertically oriented pouring aperture therein, a tab member having a front end, a rear end and a bottom surface, hinge means connecting the bottom end of said tab member to the top surface of said lid, a rubber stopper secured to the bottom surface of said tab member for closing said pouring aperture.

5,067,329

CANNED BEVERAGE HOLDER

David L. Tomlinson, 1414 N. Minnesota, Shawnee, Okla. 74801, assignor to T Z & B Products and David L. Tomlinson, both of Shawnee, Okla., a part interest

Filed Sep. 25, 1990, Ser. No. 587,739
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—457.4 **3 Claims**



1. A can holder in combination with a thermally insulated drinking mug having an entry lip and being adapted to contain a selected coolant, comprising:

an annular cap having an inner wall, an upper rim and bottom surface with a circular slot extending upward through the bottom surface, said circular slot being adapted for tightly receiving said entry lip therein, having an annular shoulder formed inwardly adjacent the inner wall of the annular cap;

a plurality of generally equally spaced bail struts connected to extend in parallel disposition from adjacent the inner wall of the annular cap into the drinking mug;

a bail base member connected between the respective bail struts within the drinking mug;

sealing means having an axial opening disposed within said annular cap to receive a can therethrough in sealed joinder for positioning as supported on said bail base in contact with the drinking mug coolant; and

a snap ring firmly received within the annular cap inner wall to retain said sealing means in position.

5,067,330

HEAT TRANSFER APPARATUS FOR HEAT PUMPS

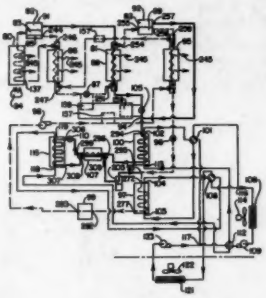
F. Bert Cook, Columbus; Stephen E. Petty, Dublin; Howard C. Meacham, Jr., Upper Arlington; Richard N. Christensen, Columbus, and Kevin R. McGahey, Hilliard, all of Ohio, assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Filed Feb. 9, 1990, Ser. No. 478,269
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—485 **27 Claims**

4. In a continuous absorption system for both refrigeration and heating modes and having a condenser, an absorber, a refrigerant vapor, a weak solution and a working fluid, the improvement being a condenser/absorber module comprising a cylindrical housing containing:

(a) a condenser means for condensation of said refrigerant vapor in both refrigeration and heating modes of said system and comprising a plurality of coils with the coils juxtaposed one to the next in a generally annular composite form with said condenser means being in heat-exchange relationship with said working fluid; and

(b) an absorber means for absorption of said refrigerant vapor in said weak solution in both refrigeration and heating modes of said system comprising a plurality of coils with the coils juxtaposed one to the next in a gener-



ally annular composite form with said absorber means being in heat-exchange relationship with said working fluid and said absorber means being juxtaposed and in concentric relation with at least a portion of said condenser means.

5,067,331

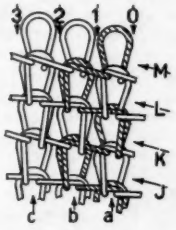
WARP KNIT FABRIC STRUCTURE AND METHOD OF PRODUCTION

Allan W. H. Porter, Stosswald 1290, C.H.9062 Lustmühle A.R., Switzerland

Continuation-in-part of Ser. No. 432,363, Nov. 6, 1989, abandoned. This application Mar. 11, 1991, Ser. No. 701,683

Int. Cl.[5] **D04B** *21/00*

U.S. Cl. 66—195 **5 Claims**



1. A warp knit fabric structure formed by means of a single needle and single guide bar comprising one thread forming a single knit loop only for each needle wale with the last part of the thread overlapping across the needle of a last needle wale traversed by each thread as overlaps across two or more needle wales at every course of knitting.

5,067,332

GUIDE BAR BEARING FOR WARP KNITTING MACHINES

Josef Roth, Seligenstadt, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 392,440

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1988, 3828469

Int. Cl.[5] **D04B** *27/06*

U.S. Cl. 66—207 **11 Claims**

1. Guide arrangement for a warp knitting machine comprising:

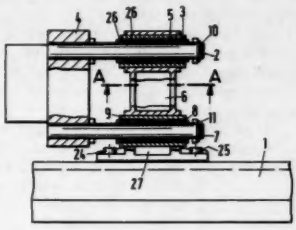
a guide bar bracket;

a guide bar frame having an upper and lower end and wherein said bearings comprise;

two parallel sleeves separately affixed about said upper and lower ends of said guide bar frame;

a guide bar attached to said guide bar frame; and

a connecting arrangement connecting between said guide bar frame and said guide bar bracket, and comprising:



(a) at least one linear bearing bolt attached to said guide bar bracket; and

(b) a bearing slidable relative to said linear bearing bold, said bearing being attached to said guide bar frame and having a ribbed bar having one transverse rib, the breadth of the transverse rib corresponding to the length of the sleeves.

5,067,333

FLOW CONTROL SYSTEMS AND/OR LAUNDRY MACHINES INCLUDING SUCH FLOW CONTROL SYSTEMS

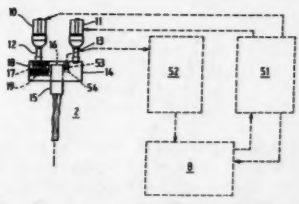
Gerald Duncan; Frank W. Shacklock, and Murray Greenman, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Division of Ser. No. 307,275, Feb. 7, 1989, Pat. No. 4,978,058. This application Oct. 19, 1990, Ser. No. 599,867

Claims priority, application New Zealand, Feb. 9, 1988, 223460

Int. Cl.[5] **D06F** *33/02;* **G05D** *23/13*

U.S. Cl. 68—23.7 **8 Claims**



1. A laundry machine comprising a cabinet in which an agitator is mounted on a vertical shaft so as to rotate therewith and is oscillated back and forth within a coaxially mounted perforated spin tub, the spin tub and the agitator rotating continuously in one direction to give a spin action and the perforated spin tub and agitator in turn being mounted within a stationary water tight container; the cabinet containing an electronically controlled electric motor having a rotor and a stator and driving means to oscillate said agitator back and forth or rotate said spin tub continuously in one direction; a flow control system to control the temperature of a mixture of two liquids, a first liquid having a high temperature level and a second liquid having a low temperature level, said flow control system comprising a mixing chamber, a first valve through which one of said two liquids flows to said mixing chamber, a second valve through which the other of said two liquids flows to said mixing chamber, at least said first valve being a proportional control valve having a valve seat, a spring loaded valve member spring loaded to a closed position against said valve seat, and an electromagnet means effective on ener-

gization thereof to actuate said valve member towards a fully open position, temperature sensing means positioned in said mixing chamber for sensing the temperature level of the mixed liquid in said mixing chamber, second valve control means responsive to said sensing means to open on actuation thereof said second valve to a desired degree of opening, and first valve control means responsive to said sensing means so that in operation with said second valve opened to said desired degree, current flowing through said electromagnet means of said first valve is controlled by said first valve control means to desired levels responsive to signals from said sensing means in a manner such that said first valve is progressively opened or closed substantially according to current flowing in said electromagnet means thereof so that the temperature of mixed liquid in said mixing chamber is maintained equal to or approaching a desired temperature level; said mixing chamber having an outlet conduit, an inlet to said outlet conduit disposed in said mixing chamber for maintaining a quantity of liquid in said mixing chamber, and an exit from said outlet conduit leading to said water tight container;

container means;

electronic devices which produce heat in use, at least some of said electronic devices being grouped and positioned together in said container means; and

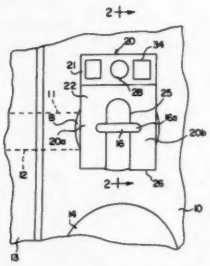
at least one surface on said container means exposed to a flow of liquid for the purpose of cooling said electronic devices.

5,067,334

DOOR LOCK SECURITY DEVICE

Clayton O. Sorkilmo, 5447 - 72nd Cir. North, Brooklyn Center, Minn. 55429

Filed Oct. 29, 1990, Ser. No. 604,971
Int. Cl.[5] E05B *17/00*
U.S. Cl. 70—416 **10 Claims**



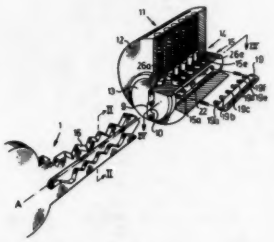
1. In combination with a door, the door having an interior surface, a door knob mounted by the door and extending inwardly of the door interior surface and a dead bolt lock mounted by the door and having a lock housing mounted by the door, and a dead bolt handle rotatably mounted by the housing and having a shaft portion extending away from the door interior surface and a cross bar portion that is of a larger transverse dimension than the shaft portion and joined to the shaft portion remote from the door interior surface, and a longitudinally elongated security member removably mounted on the door and at least in part mounted by the dead bolt lock, the security member having a first surface, a first longitudinally elongated end portion having at least part of the first surface, and a second end portion joined to the first end portion to extend longitudinally away therefrom, the second end portion having a second surface opposite from the first surface for abutting against the cross bar portion, the second end portion having a first transverse terminal edge longitudinally opposite of the first end portion and a longitudinally extending notch opening through said member surfaces and to the transverse edge for having the dead bolt handle shaft portion extended therethrough, and ribs joined to the first surface to extend away therefrom in a direction opposite the second surface for abutting against the door interior surface to decrease the possibility of the security member moving relative to the door interior surface.

5,067,335

CYLINDER LOCK AND LOCKING TUMBLER

Bo Widén, P.O. Box 37, S-644 00 Torshälla, Sweden

PCT No. PCT/SE88/00015, § 371 Date Sep. 12, 1990, § 102(e) Date Sep. 12, 1990, PCT Pub. No. WO89/06733, PCT Pub. Date Jul. 27, 1989
PCT Filed Jan. 20, 1988, Ser. No. 536,671
Int. Cl.[5] E05B *27/10*
U.S. Cl. 70—495 **10 Claims**



1. A cylinder lock comprising:

a cylinder shell;

a key plug rotationally mounted in said cylinder shell to provide a shear line between the cylinder shell and the key plug;

a longitudinal key slot extending into said key plug generally parallel to a rotational axis thereof for receiving a key blade, the key blade having an elongated generally longitudinally extending wave-like code pattern;

a row of lock tumblers, each of said tumblers having a body part and a finger, each of the body parts of the tumblers being non-rotatably guided for elevational movement only in an associated transverse cavity in said key plug, each of the fingers of the tumblers projecting transversely outwardly from said body part to extend into said key slot and engage the code pattern of a properly shaped key blade inserted into the key slot, said fingers being located in such predetermined positions that a free end portion of each finger forms a specific, irregular longitudinal distribution pattern different from a longitudinal distribution of the tumbler body parts; and

a fence member for blockingly associating the locking tumblers with the cylinder shell so that elevational positioning of said locking tumblers with said properly shaped key blade enables clearance of the shear line.

5,067,336

DEVICE FOR PRESSING SHEET MATERIAL

Gabriel de Smet, Nogent sur Oise, France, assignor to Isoform, France

Filed Dec. 28, 1989, Ser. No. 458,169
Claims priority, application France, Dec. 30, 1988, 88 17525
Int. Cl.[5] B21D *22/12, 26/00*
U.S. Cl. 72—57 **19 Claims**

1. A device for pressing a sheet material blank, in particular a sheet metal blank, comprising:

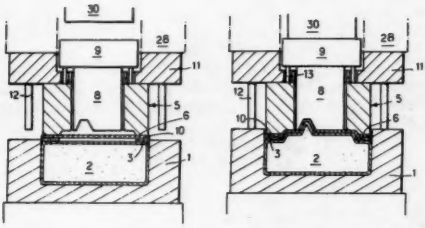
a cushion comprising an elastic material,

a retaining box surrounding the cushion,

means for preforming the sheet blank comprising an outer slide, an upper blank holder operatively connected to the outer slide, and means for finally forming the sheet blank comprising a central slide, and a punch operatively connected to the central slide, and

supporting and maintaining means for at least a portion of the sheet blank comprising a movable lower blank holder

comprising a rigid structure wherein said lower blank holder is positioned directly on the elastic cushion and



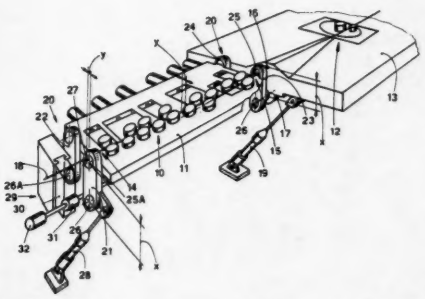
cooperates with the upper blank holder for gripping the sheet blank at least in localized regions thereof.

5,067,337

DEVICE FOR THE CONTROLLED AND INDEPENDENT ROCKING OF STRAIGHTENING AND BENDING PLATFORMS

Giorgio Del Fabro, Montegnacco, Italy, assignor to M.E.P. Macchine Elettroniche Piegatrici, SpA, Reana Del Rojale, Italy

Filed Oct. 5, 1990, Ser. No. 593,757
Claims priority, application Italy, Oct. 20, 1989, 83490 A/89
Int. Cl.[5] B21D *3/02, 7/024*
U.S. Cl. 72—161 **9 Claims**



1. A bending-shaping machine for shaping rod being fed therethrough, comprising:

a straightening platform having a straightening assembly provided thereon for straightening said rod;

a bending platform having a bending assembly provided thereon, said bending platform being located downstream of said straightening platform and being orientable independently from siad straightening platform said bending assembly performing a different shaping operation on said rod than said straightening assembly;

means for inclining said bending platform by rotating said bending platform about an axis of rotation so as to have a preferred angle of inclination dependent on a shape to be given the rod being processed, said axis of rotation being positioned below and at a distance "x" from an axis of inlet of rod to said bending platform; and

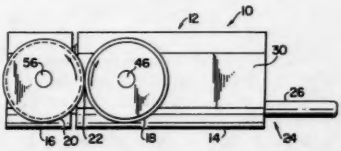
a parallelogram system for supporting and positioning said straightening platform, said parallelogram system comprising a pair of frontal arms and a pair of rear arms positioned at four parallel sides of a parallelogram, each of said arms having an upper pivot and a lower pivot, said straightening platform being supported at said upper pivots, a pivot axis of said lower pivots of said frontal arms coinciding with said axis of rotation of said bending platform and being distant by said value "x" from an axis which passes through said upper pivots of said frontal arms and which coincides substantially with said axis of inlet of said rod into said bending platform.

5,067,338

METAL WORKING ATTACHMENT FOR PORTABLE POWER TOOL

Ronald Wilchynski, P.O. Box 494, Cheshire, Conn. 06410

Filed Jan. 18, 1990, Ser. No. 466,971
Int. Cl.[5] B21D *5/14*
U.S. Cl. 72—182 **16 Claims**



1. Metal working tool attachment for a portable power tool having a rotary output shaft and comprising an elongate generally cylindrical body assembly which defines a first longitudinal axis, said body assembly having a front part and a rear part, mounting means for supporting said front part for rectilinear movement along said first longitudinal axis toward and away from said rear part, a rotary drive tool journalled for rotation on said rear part and about a first transverse axis generally normal to the direction of extent of said first longitudinal axis, driving means on said rear part for coupling engagement with said output shaft on said associated portable power tool to rotate said drive tool and including a drive shaft journalled on said rear part along a second longitudinal axis parallel to said first longitudinal axis, said drive shaft extending in a rearward direction from and beyond said rear part for rotation about said second longitudinal axis, at least one rotary reaction tool journalled for free rotation on said front part about a second transverse axis parallel to said first transverse axis, said reaction tool cooperating with said drive tool to form a nip region therebetween, and adjusting means for moving said front part in a direction along said first longitudinal axis toward and away from said rear part to adjust the position of said reaction tool relative to said drive tool.

5,067,339

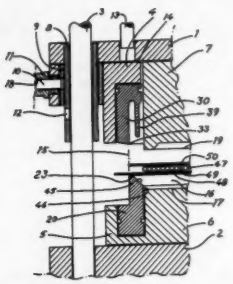
CUTTING AND FORMING TOOL FOR COMPLICATED FLAT STRUCTURES

Gerhard Pirchl, Birrwil, Switzerland, assignor to AAW Producktions Aktiengesellschaft, Fu Rstentum, Liechtenstein

PCT No. PCT/CH88/00187, § 371 Date Aug. 15, 1989, § 102(e) Date Aug. 15, 1989, PCT Pub. No. WO89/03751, PCT Pub. Date May 5, 1989
PCT Filed Oct. 11, 1988, Ser. No. 392,948
Claims priority, application Switzerland, Oct. 29, 1987, 4241/87-8
Int. Cl.[5] B21D *28/14;* **B26F** *1/44*
U.S. Cl. 72—329 **8 Claims**

1. A cutting and forming tool for cutting and forming flat objects with at least one complicated nonlinear cutting and forming line to form complex flat structures, the cutting and

forming tool including a tool upper part with a cutting stamp and a tool lower part with a cutting plate, the cutting stamp and cutting plate being movable along an axis towards and away from one another with the distinction that the cutting plate (5) and the cutting stamp (4) each include a plurality of adjoining cutting elements (20, 30) the cutting elements of the cutting plate cooperating with the cutting elements of the cutting stamp, each cutting element having the form of a prism and having a polygonal cross-sectional area taken in a direction transverse to the axis and lined up one after another in the zone



of a cutting line (15), each of the cutting elements (20, 30) being the same size and having a cross-sectional area of the same form, each of the cutting elements (20, 30) having a cutting edge (23, 33) in a first end surface (21, 31), the cutting edges (23, 33) of the cutting elements (20, 30) forming a continuous nonlinear cutting line, each of the cutting elements (20, 30) having a second end surface (22, 32) which is opposite the first end surface (21, 31), the second end surface (22, 32) of each of the cutting elements (20, 30) and the adjoining end portion of each of the cutting elements (20, 30) being anchored into the respective cutting plate (5) and the cutting stamp (4).

5,067,340

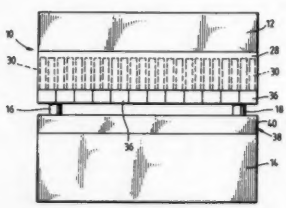
PRECISION PRESS BRAKE

Donald C. MacGregor, 13 Hunters Trail, Warren, N.J. 07060

Continuation-in-part of Ser. No. 190,632, May 5, 1988, abandoned. This application May 3, 1989, Ser. No. 345,675

Int. Cl.[5] B21D *5/01*

U.S. Cl. 72—389 **17 Claims**



1. A bending press, comprising:

(a) a fixed lower frame member;

(b) a fixed upper frame member mounted above the lower frame member;

(c) tool holding means positioned in operative association with one of the frame members for holding bending tool means;

(d) die holding means positioned in operative association with the other of the frame members for holding die means;

(e) a plurality of first hydraulic rams mounted in laterally spaced relationship to be operative between the tool holding means and the associated frame member;

(f) a plurality of second hydraulic rams mounted in laterally spaced relationship to be operative between the die holding means and the associated frame member;

(g) the first hydraulic rams being adapted to be hydraulically connected together during use for hydraulic fluid to distribute a load applied to a workpiece during use evenly between the first hydraulic rams and provide compensation for frame member deflection during use;

(h) the second hydraulic rams being adapted to be hydraulically connected together during use for hydraulic fluid to distribute a load applied to a workpiece during use evenly between the second hydraulic rams and provide compensation for frame member deflection during use; and

(i) deactivation means for selectively deactivating one or more of the hydraulic rams.

5,067,341

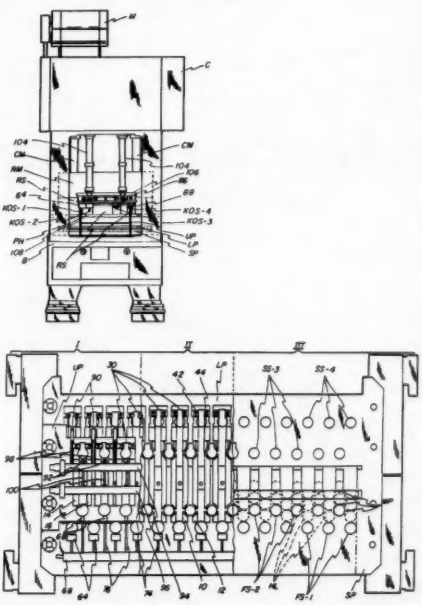
TRANSFER PLATE LIFTS FOR SHELL PRESS

David K. Wynn, Tipp City, and Omar L. Brown, Dayton, both of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jan. 19, 1990, Ser. No. 467,811

Int. Cl.[5] B21D *43/00*

U.S. Cl. 72—426 **29 Claims**



26. A method for providing access to tooling elements for the production of shells, as for can ends, in a ram press, having a base and a ram supported for movement between an upstroke and a downstroke position above said base, comprising:

supporting cooperating upper and lower tooling on the press ram and the press base respectively and dividing the tooling into first and second tooling stations;

supporting knock-out bars at a stationary operative lower position below a lower surface of said ram and above said first and second station upper toolings wherein said knock-out bars carry downwardly extending knock-out stems for cooperating with an upper portion of said upper toolings when said ram is in said upstroke position;

supporting a lower transfer plate above said press base and below said ram;

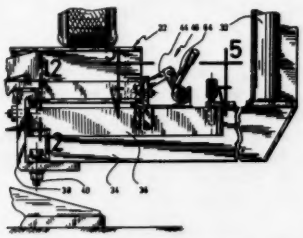
supporting an upper transfer plate above said lower transfer plate and below said ram;
moving said ram to said upstroke position;
moving said knock-out bars upwardly away from said base to a point closely adjacent to the lower surface of said ram; and
raising said ram and said knock-out bars together above said upstroke position of said ram.

5,067,342

SLIDING AND LOCKING SYSTEM FOR A FORCE APPLYING STRUCTURE ON A VEHICLE STRAIGHTENING BENCH

Marcel J. Bergeron, 288, Rang St-Edouard, Iberville, Quebec J2X 4J3, Canada

Filed May 7, 1990, Ser. No. 519,660
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—447 **8 Claims**



1. A sliding and locking system for a force applying structure on a vehicle straightening bench having a generally rectangular pathway for supporting a vehicle, said pathway being characterized by a truss beam having a rectangular cross-section with a lower face having an outer and an inner marginal ledge, said system comprising:
a primary transverse beam disposed crosswise under said pathway and extending outwardly from said pathway for supporting said force applying structure, said primary transverse beam being vertically spaced from the lower face of said pathway;
first roller means rotatably fixed to said primary transverse beam adapted to support said transverse beam on the upper surface of the outer marginal ledge, and act as a fulcrum for said transverse beam;
second roller means rotatably fixed to said primary transverse beam adapted to contact the lower surface of the inner marginal ledge upon leverage action of the transvers beam around said fulcrum, said first and second roller means allowing said primary transverse beam to rotatably slide along said pathway;
locking means secured on the primary transverse beam adapted to exert a downward pressure on the upper surface of said outer marginal ledge for producing a reverse action to said leverage action and tightening said outer marginal ledge on said primary transverse beam.

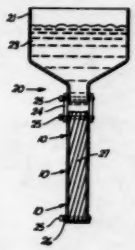
5,067,343

METHOD FOR TESTING WATER IMPERVIOUS CABLE

James H. Sullivan, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Sep. 4, 1990, Ser. No. 577,190
Int. Cl.[5] G01M *3/22*
U.S. Cl. 73—40.7 **4 Claims**

1. A method for testing the continuity of a water blocking compound, said compound having been applied to the interstitial spacing of a stranded electrical conductor, comprising the steps of:
providing a sample of stranded conductor, said conductor having a first and a second end, said conductor treated with moisture blocking compound;
applying a sealing and supporting means to said stranded conductor for sealing and supporting said stranded conductor strands; connecting said first end of said conductor to a source of colored liquid; and
monitoring said second end of said conductor for penetration of said colored liquid.

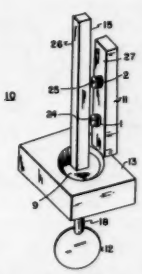


5,067,344

VIBRATORY VISCOMETER TRANSDUCER WITH ISOLATION SUPPORT FOR INLINE VISCOSITY SENSOR

John V. Fitzgerald, Metuchen, and Teresa M. Walsh, Lawrenceville, both of N.J., assignors to Natonal Metal and Refining Company, Inc., Metuchen, N.J.

Continuation of Ser. No. 348,695, May 8, 1989, abandoned. This application Mar. 8, 1991, Ser. No. 667,238
Int. Cl.[5] G01N *11/16*
U.S. Cl. 73—54 **10 Claims**



1. A transducer for a vibratory viscometer, comprising:
a support member having a base part and a driver/pickup supporting part having a transducer mounting surface including drive means and pickup means, said base part containing a relatively compliant isolation plate, and wherein said drive means and pickup means are located in said driver/pickup supporting part exclusively;
an elongated relatively rigid unitary bar extending through said isolation plate, a peripheral region of said bar being secured and sealed to the adjacent portion of said isolation plate, said bar having an upper portion of rectangular cross-section to facilitate interaction with said drive means and pickup means disposed on one side of said isolation plate and a lower portion of circular cross-section to reduce the effects of turbulence disposed on the other side of said isolation plate;
a sensor tip in the form of a narrow blade-like disk or plate having opposed major surfaces secured to the lower portion of circular cross-section of said bar and adapted for immersion in a fluid;
drive means operatively associated with the upper portion of said bar for flexurally oscillating said bar with respect to

the base part of said support member at the mechanical resonant frequency of the bar-isolation plate-fluid system, in a direction parallel to the planes of the major surfaces of said sensor tip and perpendicular to the transducer mounting surface of said driver/pickup supporting part, so as to maximize generation of shear waves and minimize generation of compression waves in said fluid; and

pickup means operatively associated with the upper portion of said bar for detecting the oscillation of said bar.

5,067,345

METHOD AND APPARATUS FOR MEASURING AND CALCULATING BULK WATER IN CRUDE OIL OR BULK WATER IN STEAM

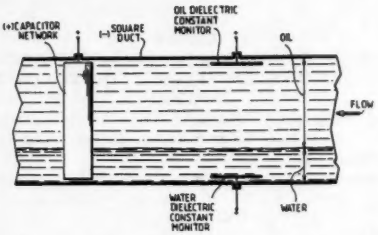
Marcel L. Mougne, 1107 Briarpark Dr., Houston, Tex. 77042

Continuation-in-part of Ser. No. 215,058, Jul. 5, 1988, Pat. No. 4,916,940. This application Apr. 16, 1990, Ser. No. 509,896

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] G01N *27/22, 33/22*

U.S. Cl. 73—61.10 R **22 Claims**



1. An improved apparatus for detecting and calculating bulk water content in steam comprising:

a) a capacitor array, said array conforming to the cross-section of a duct used to transfer the steam, said capacitor array inserted in the steam duct;

b) a capacitance measurement system;

c) a means to calculate the water content of the steam conveyed in said duct based on the measured capacitance.

5,067,346

PENETRATING MEASURING INSTRUMENT

John S. Field, Berowa Heights, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

PCT No. PCT/AU87/00202, § 371 Date Jan. 10, 1989, § 102(e) Date Jan. 10, 1989, PCT Pub. No. WO88/00691, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 7, 1987, Ser. No. 299,835

Claims priority, application Australia, Jul. 10, 1986, PH6842

Int. Cl.[5] G01N *3/42*

U.S. Cl. 73—81 **10 Claims**

1. A penetration measuring apparatus comprising:

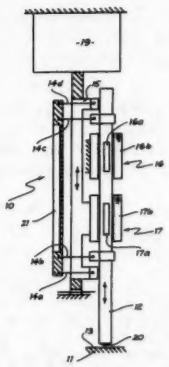
a stage for mounting a sample of the material to be tested thereon;

a probe having one end thereof proximal to said stage and having a longitudinal axis extending orthogonally of said stage;

an ultra-micro hardness indenter located in said one end of said probe;

a carriage assembly to which said probe is connected via only an intermediate member, first elastic connection means of known stiffness connecting said probe to said intermediate member and second elastic connection means of known stiffness connecting said intermediate member to said carriage assembly, said first and second elastic connection means thereby allowing axial movement of said probe but preventing movement of said probe in any other direction;

means for driving said carriage assembly towards and away from said stage;



first means for measuring the movement of said probe relative to a stationary datum; and

second means for measuring the deformation of said first and second elastic connection means connecting said probe to said carrier assembly.

5,067,347

METHOD AND APPARATUS FOR TESTING A PNEUMATIC TIRE

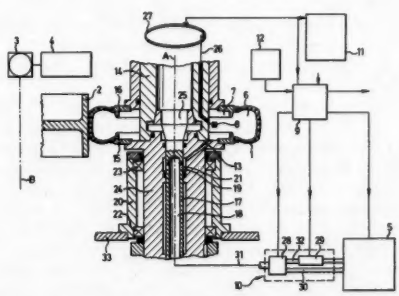
Uwe Mönch, Bensheim, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Jul. 19, 1990, Ser. No. 554,402

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932674

Int. Cl.[5] G01M *17/02*

U.S. Cl. 73—146 **14 Claims**



8. Apparatus for controlled inflation of a pneumatic tire with compressed air in a tire testing machine comprising a stationary compressed air source, a compressed air conduit for supplying compressed air from said source to the interior of the tire to be tested, a control means for controlling the supply of compressed air in dependence on an air pressure detected by a pressure sensor, a temperature setting means arranged in the compressed air conduit between said source and the interior of the tire, for setting the temperature of the air passing in the compressed air conduit, a temperature sensor adapted to sense a temperature in the interior of the tire, and a control means connected to the temperature sensor for actuating the temperature setting means in dependence on the temperature detected by the temperature sensor.

5,067,348

ROTARY MEMBER MEASURING APPARATUS WITH IMPROVED SUPPORT BED

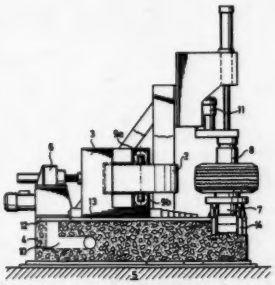
Günther Himmler, Darmstadt, and Uwe Moench, Bensheim, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Apr. 19, 1990, Ser. No. 511,084

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1989, 3919450

Int. Cl.[5] G01M *1/02*

U.S. Cl. 73—460 6 Claims



1. A rotary member measuring apparatus for measuring at least one of the periodically varying forces and moments produced by a rotating rotary member, where at least one of a radial, lateral, and tangential force fluctuation is detected, comprising:

mounting means for rotatably mounting the rotary member;

means for detecting at least one of a radial, lateral, and tangential force; and

a stationary machine bed providing a foundation for the measuring apparatus and which serves as a common supporting component for the detecting means and the rotary member mounting means, the machine bed being in the form of a block-shaped casting comprised of polymer concrete.

5,067,349

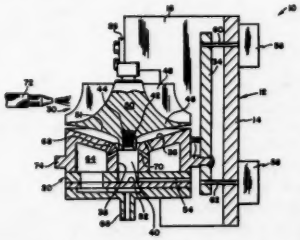
METHOD AND APPARATUS FOR BALANCING ROTATING COMPONENTS

Richard A. Hirchert, Pacific Palisades, Calif., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 27, 1990, Ser. No. 500,434

Int. Cl.[5] G01M *1/02*

U.S. Cl. 73—472 4 Claims



1. Apparatus for dynamically balancing components rotatable about an axis of rotation comprising a fixed support, a balancing fixture, flexure means for mounting said balancing fixture on the fixed support for movement relative thereto, said balancing fixture defining an arborless balancing surface contoured for compatibility with a corresponding surface defined on said component, said component including a hub projecting along said axis, said balancing surface including a portion defining the wall of a recess receiving said hub, means for injecting fluid under pressure between the balancing surface and the corresponding surface on said component to support the component on a fluid film between said surfaces for rotation relative thereto, said injecting means including a fluid manifold defined within said balancing fixture, a first set of spaced-apart pressure jets extending through the balancing surface for communicating said manifold with the interface between said balancing surface and the corresponding surface on the component, and a second set of spaced-apart pressure jets for injecting fluid under pressure in the interface between said hub and the portion of the balancing surface defining said recess, means for rotation said component about said axis relative to said surface, and means for measuring displacement of the surface to determine unbalance of said component.

5,067,350

SENSOR TO DETERMINE ROTATIONAL PARAMETERS

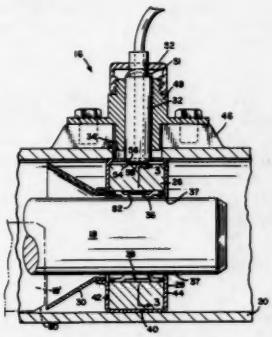
John M. Grillo, Torrington; James A. Hilby, Watertown; Mark E. La Croix, New Hartford; Mark A. Polinsky, Torrington, and Gordon L. Steltzer, Torrington, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 482,694, Feb. 21, 1990, abandoned.

This application Dec. 14, 1990, Ser. No. 626,423

Int. Cl.[5] G01P *1/02*

U.S. Cl. 73—494 16 Claims



1. An apparatus for determining parameters of relative rotation of a rotatable shaft mounted within a tube, comprising:

a substantially annular shaped target;

attachment means for attaching the target to the shaft to restrain relative rotation which permits axial movement therebetween;

target retaining means for restraining axial movement of the target relative to the tube in both axial directions, the target retaining means being securely attached to an inner wall of the tube, the target being rotatable relative to said target retaining means;

a sensor extending through a wall opening formed in the tube; and

mounting means for mounting the sensor relative to the tube.

5,067,351

MAGNETOHYDRODYNAMIC ANGULAR RATE SENSOR FOR MEASURING LARGE ANGULAR RATES

Darren R. Laughlin, Albuquerque, N. Mex., assignor to Applied Technology Associates, Inc., Albuquerque, N. Mex.

Filed Oct. 25, 1989, Ser. No. 426,254

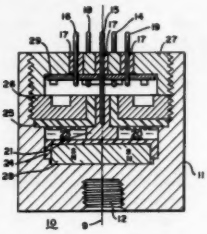
Int. Cl.[5] G01P *15/00*

U.S. Cl. 73—516 LM 7 Claims

1. An electronic angular rate sensor comprising:

a metallic case open at one end having a high magnetic flux density including a central cavity;

a magnet located at the bottom of said case, having a north-/south axis oriented in the direction of said cavity axis;
an insulating member covering said magnet and sealing said magnet from the remaining portion of said cavity;
a conductive center post having one end supported on said insulating member, extending along the axis of said cavity;
a channel cap disposed in said cavity and spaced apart from said insulating member, forming a sealed channel with said



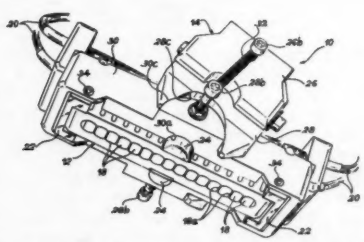
insulating member and said metallic case, said channel containing mercury, said channel cap having a central opening through which said center post extends; and,
an amplifying circuit mounted on a header which closes said cavity, having first and second input connections connected respectively to said metallic case and said center post, providing a voltage proportional to the angular rate of said metallic case about said central cavity axis.

5,067,352

ULTRASONIC CONTROL HEAD FOR PARTS WHOSE SHAPE EVOLVES DURING PRODUCTION

Michel Floret, Gennevilliers, France, assignor to Aerospatiale Societe Nationale Industrielle, Gennevilliers, France

Filed Jan. 24, 1990, Ser. No. 469,846
Claims priority, application France, Feb. 2, 1989, 89 01344; May 30, 1989, 89 07110
Int. Cl.[5] G01N *29/24, 29/10*
U.S. Cl. 73—583 **18 Claims**



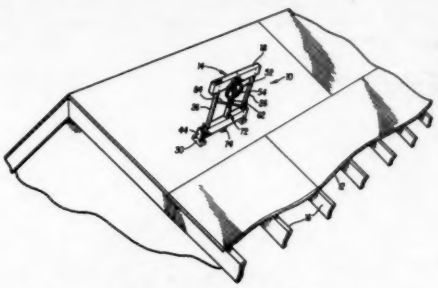
1. Head for control by ultrasonics of parts of any shape and comprising a ductile small bar which supports a set of ultrasonic transducers with coplanar axes and functioning by a reflected wave, said ductile small bar being made of an elastic material and at rest presents a curve along a longitudinal direction of said bar, and contact blocks distributed along the small bar and being suitably-adapted to be brought simultaneously into support on a surface of a part to be controlled so that the axes of all the transducers are approximately perpendicular to this surface and cut said surface at points separated by approximately constant distances independent of the shape of said part, wherein the ductile small bar roughly forms a comb comprising a linking branch with a variable curve and suitable for being turned towards said part, and teeth remaining approximately perpendicular to the linking branch and housing each of the transducers.

5,067,353

ROOF SHEATHING TEST SYSTEM

Stanley J. Sersen, 1138 Valley Dr., Pasadena, Md. 21122

Filed Mar. 26, 1991, Ser. No. 674,959
Int. Cl.[5] G01N *3/20*
U.S. Cl. 73—849 **20 Claims**



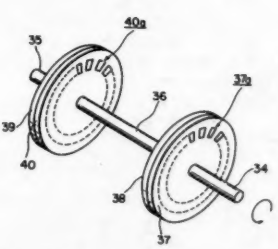
1. A roof sheathing test system comprising:
(a) a test frame mounted to at least a pair of roof structural members;
(b) means for mounting said test frame to said roof structural members;
(c) a load cell coupled to said test frame member for registering a force load applied to said sheathing;
(d) means for applying said force load to said sheathing; and,
(e) means for measuring a deflection of said sheathing responsive to said force load applied to said sheathing.

5,067,354

TORQUE TRANSDUCER AND TORQUE MEASURING DEVICE

Masayasu Kawai, Tokyo, Japan, assignor to Kyowa Electronic Instruments Co., Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,789
Claims priority, application Japan, May 31, 1988, 63-131467
Int. Cl.[5] G01L *3/12*
U.S. Cl. 73—862.34 **15 Claims**



2. A torque transducer comprising:
a drive side rotating member and a load side rotating member mounted on the drive side and load side respectively and each being provided with a plurality of first slits having a similar shape;
a drive side stationary member and a load side stationary member fixedly mounted on a stationary part adjacent to said drive side rotating member and load side rotating member, respectively, and each being provided with a plurality of second slits having a similar shape, and the shape of said second slits being different from the shape of said first slits;
a drive side opening amount detector and a load side opening amount detector for detecting a relative amount of opening formed by a first slit and a second slit on said drive side and a relative amount of opening formed by a

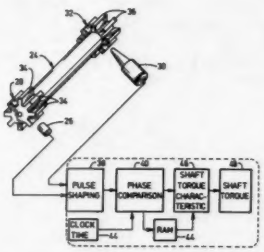
first slit and a second slit on said load side, respectively, and for converting these relative opening amounts into electric signals, to thereby detect a torque transmitted to a torque transmission shaft by detecting a relative phase difference between said both rotating members based on periodic changes in the outputs received from said both opening amount detectors;

a plurality of said drive side opening amount detectors and a plurality of said load side opening amount detectors being arranged in a circumferential direction at equiangular intervals and facing said second slits formed in said stationary members at said drive side and at said load side, to obtain a periodic change of said relative opening amount formed at an arbitrary time by said first slits and said second slits on the drive side, and said first slits and said second slits on said load side, respectively, and said relative opening amount being repeatedly and periodically gradually increased and decreased in the circumferential direction over at least one cycle.

5,067,355
SHAFT TORQUE MEASUREMENT

James R. Witte, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 13, 1990, Ser. No. 552,393
Int. Cl.[5] G01L *3/10*
U.S. Cl. 73—862.34 **6 Claims**



1. A method of determining the power output of a gas turbine engine having a compressor coupled therewith, the engine including a power shaft, at least one multiple blade turbine disk coupled to the shaft, a speed sensor, and a pyrometer, the method comprising the steps of:

rotating the shaft under relatively low load conditions and obtaining a first set of signals from the speed sensor corresponding to the angular rotation of the shaft and a second set of signals from the pyrometer representing the temperature of each blade turbine disk as each blade passes a predetermined point adjacent the pyrometer;

conditioning the first and second sets of signals to develop corresponding first and second sets of pulse signals in which each pulse signal in the first set of pulse signals has a determinable first phase relationship to each pulse signal in the second set of pulse signals;

operating the engine under at least another relatively higher load condition and obtaining another first set of signals from the speed sensor and another second set of signals from the pyrometer;

conditioning the another first and second sets of signals to develop another corresponding set of pulse signals;

determining another phase relationship between at least one pulse developed from the another first set of signals and at least one pulse developed from the another second set of signals;

comparing the first phase relationship to the another phase relationship and obtaining a difference therebetween;

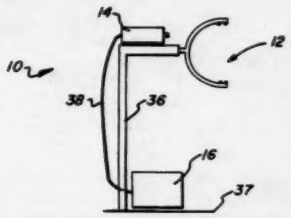
determining the degree of twist in the engine shaft corresponding to the obtained phase relationship difference; and

converting engine shaft twist to a corresponding torque value which will induce such twist for determining the power output of the engine from predetermined relationships between torque and power.

5,067,356
CONDITIONAL SAMPLING TECHNIQUE FOR FLUX MEASUREMENT

Joost A. Businger, Anacortes, Wash., assignor to University Corporation for Atmospheric Research, Boulder, Colo.

Filed Feb. 26, 1990, Ser. No. 485,152
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.02 **18 Claims**



1. Apparatus for determining the vertical flux of a component carried by a vertically moving gas in an ambient environment over a predetermined sampling item period, comprising:

means for measuring the magnitude and direction of the vertical velocity of said moving gas and for supplying a gas movement signal indicative of said magnitude and direction;

control mans responsive to said gas movement signal for comparing the absolute value of said magnitude of said vertical gas velocity to a predetermined threshold value, and for supplying (an up signal upon said gas movement signal including that said measured vertical gas velocity is in an upward direction and said magnitude of the measured vertical gas velocity exceeds said predetermined threshold value, and for supplying (b) a down signal upon said gas movement signal indicating that said measured vertical gas velocity is in a downward direction and said magnitude o he measured vertical gas velocity exceeds said predetermined threshold value;

component collection means comprising:

a first and a second reservoir means or each receiving and containing samples of said gas and said component,

valve means responsive to aid up and down signals for conducting samples of said gas and said component from the environment into said first or second reservoir means respectively;

said valve means open substantially fully without restriction to conduct one of said samples to said first reservoir means upon receipt of said upon signal and costing to fully terminate the flow of said one sample to said fist reservoir means upon elimination of said up signal;

said valve means opening subsonically fully without restriction to conduct one of said samples to said second reservoir means upon receipt of said down signal and closing to fully terminate the flow of said one sample to said second reservoir means upon termination of said down signal;

said control means periodically storing data indicative of said measured magnitude and direction and calculating the standard deviation of said magnitude f the vertical velocity of said gas from said stored data during said sampling time period; and

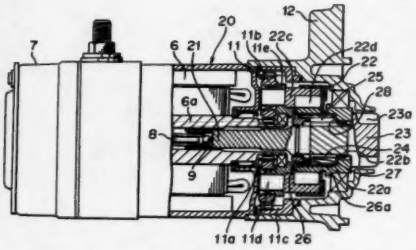
said control means further multiplying aid standard aviation by a predetermined coefficient and the difference in concentrations of said component conducted into said fist and second reservoir means.

5,067,357

COAXIAL TYPE STARTER DEVICE

Shuzou Isozumi, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 554,650
Claims priority, application Japan, Aug. 19, 1989, 1-213687
Int. Cl.[5] F02N *11/00*
U.S. Cl. 74—7 E 3 Claims



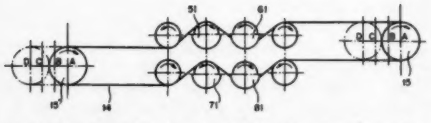
1. A coaxial type starter device which comprises an overrunning clutch device having a clutch inner member and a pinion shaft with a pinion at an end, said pinion shaft being inserted in said clutch inner member so as to be engageable therewith by means of helical splines formed at said pinion shaft and said clutch inner member so that a torque is transmitted from said clutch inner member to said pinion shaft and a radial load by said pinion shaft is borne by the helical spline of said clutch inner member, wherein the helical splines of said clutch inner member and said pinion shaft have radially contacting portions wherein either the outer surfaces of the teeth of the helical spline of said clutch inner member or the bottom surfaces of the teeth of said pinion shaft are in slide-contact with the corresponding parts of the helical spline of said pinion shaft or said clutch inner member, and have radially non-contacting portions wherein the other portions of the helical spline of said clutch inner member or said pinion shaft face, with gaps, the corresponding parts of the helical spline of said pinion shaft or said clutch inner member, and wherein the total surface area of said radially contacting portions is larger than that of said radially non-contacting portions.

5,067,358

VIBRATING TABLE INSTALLATION FOR THE MANUFACTURE OF CONCRETE PRODUCTS

Daniel M. Ancrenaz, Bonneville, France, assignor to Etablissements Balbinot S.A., Bonneville, France

Filed Jun. 1, 1990, Ser. No. 531,931
Claims priority, application France, Jun. 2, 1989, 89 07564
Int. Cl.[5] B28B *1/08, 7/22*
U.S. Cl. 74—61 9 Claims



1. A vibrating table installation for the manufacturing of concrete products comprising:

a vibrating table flexibly mounted on a stand;

shafts contained in housings connected to the table for vibrating said table, said shafts being equipped with eccentric weights, axes of said shafts being parallel, and said axes disposed such that a first pair of shafts lies in a first plane and a second pair of shafts lies in a second plane, said first plane and said second planes being parallel and spaced apart from one another, each shaft carrying at one end a notched drive roller;

at least one rotating cylinder motor for driving a double-sided notched belt, said motor having an axis parallel to said shafts and disposed in a third plane parallel to said first and second planes;

a return roller having an axis parallel to said shafts and disposed in a fourth plane parallel to said third plane, said return roller placed on the opposite side of said shafts from said motor;

said double-sided notched belt passing alternatively under and above, or above and under, the notched drive rollers for the first pair of shafts, then around said return roller, before passing alternatively respectively above and under, or under and above, the notched drive rollers for the second pair of shafts, and then returns to roll around the motor; and

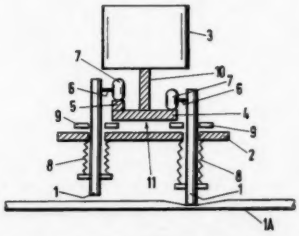
a slide for supporting the motor and the return roller, said slide being movable transversely in relation to the shafts in a fifth plane parallel to said third and fourth planes in order to alter the relative angular position of the eccentric weights for each pair of shafts.

5,067,359

APPARATUS FOR CLAMPING FLEXIBLE TUBES

Hans-Jürgen Flaig, Lauterbach, and Paul Jahn, Frankfurt, both of Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg Von der Hohe, Fed. Rep. of Germany

Filed Jul. 3, 1990, Ser. No. 548,165
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1989, 3923837
Int. Cl.[5] F16H *21/44;* F16K *31/02*
U.S. Cl. 74—107 23 Claims



1. An apparatus for clamping flexible tubes comprising:

at least one plunger means longitudinally displaceable along a first longitudinal axis, said plunger means adapted to be biased in a first longitudinal direction;

at least one support means; and

at least one cam element rotatably movable by drive means for longitudinally moving said plunger along said first longitudinal axis, said cam element comprising a cam disc adapted to rotate about a second longitudinal axis parallel to said first longitudinal axis of said plunger means, said cam disk having on at least one surface a cam path having elevated and recessed portions for interacting with said plunger means.

5,067,360

TOROIDAL CONTINUOUSLY VARIABLE TRANSMISSION

Masaki Nakano, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 21, 1990, Ser. No. 586,084
Claims priority, application Japan, Sep. 26, 1989, 1-249889
Int. Cl.[5] F16H *15/08*
U.S. Cl. 74—200 9 Claims

1. A toroidal continuously variable transmission comprising:

a housing;

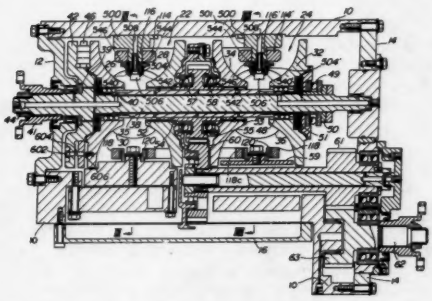
first coaxial input and output toric elements rotatably supported in said housing and being arranged opposite each other such that a first toric cavity is formed therebetween;

second coaxial input and output toric elements rotatably supported in said housing and being arranged opposite each other such that a second toric cavity is formed therebetween;

said first and second input and output toric elements being coaxial and rotatable about an axis and arranged such that said first and second output toric elements are disposed between said first and second input toric elements;

first motion transmitting traction rollers, disposed in said first toric cavity in radial symmetry with respect to said axis and in engagement with said opposite first input and output toric elements, for the transmission of motion therebetween;

second motion transmitting traction rollers, disposed in said second toric cavity in radial symmetry with respect to said axis and in engagement with said opposite second input and output toric elements, for the transmission of motion therebetween;



a first roller support structure for each of said first motion transmitting traction rollers;

a second roller support structure for each of said first motion transmitting traction rollers;

tension sheets for said first and second roller support structures for balancing forces applied to said first and second motion transmitting traction rollers, said tension sheets including a first tension sheet extending between and interconnecting said first roller support structures, and a second tension sheet extending between and interconnecting said second roller support structures, said first and second tension sheets each having a central portion and a guide structure associated therewith in said central portion thereof, each of said guide structures including a guide block; and

a guide block support member, mounted to said housing and interconnecting said guide blocks of said guide structures associated with said first and second tension sheets, for balancing forces applied to said guide blocks integrally interconnected thereby.

5,067,361

TRANSMISSION SERIES

Sepp Lachenmaier, Händelstrasse 9, 7500 Karlsruhe 21, Fed. Rep. of Germany

Filed Apr. 9, 1991, Ser. No. 682,293

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012188

Int. Cl.[5] F16H *3/08*

U.S. Cl. 74—325 **9 Claims**

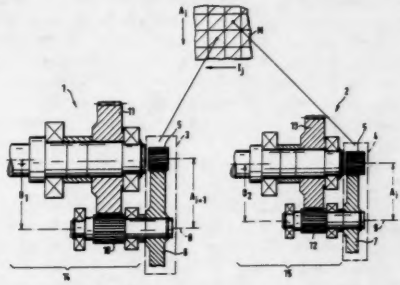
1. A series of gear transmissions comprising:

a plurality of gear transmissions of different sizes (B_i=B_1. . . B_m) and different transmission ratios (I_i=I_1 . . . I_n);

a variable gear stage in each of said plurality of transmissions comprised of a first gear and a second gear meshing with said first gear, said first gear and said second gear having a different center distance (A_i=A_1. . . A_m) for each transmission size (B_i); said variable gear stage within said series of gear transmissions comprising:

(i) a range of permissible sizes (B_i=B_1. . . B_m) with respective center distances (A_i=A_1. . . A_m) and

(ii) a range of permissible nominal transmission ratios (I_i=I_1. . . I_n) which is the same for all sizes (B_i), so that the center distances (A_i) and the transmission ratios (I_i) form a matrix (M),



said graduated center distances and transmission ratios being correlated so that a same size first gear is common to a variation stage sequence (S) comprising a plurality of different transmission size and ratio combinations of said matrix.

5,067,362

CONTROL DEVICE

Willy Holdenried, Immenstaad, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

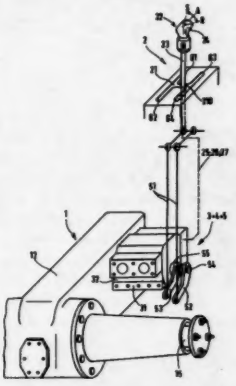
PCT No. PCT/EP88/00424, § 371 Date Nov. 22, 1989, § 102(e) Date Nov. 22, 1989, PCT Pub. No. WO88/09452, PCT Pub. Date Dec. 1, 1988

PCT Filed May 18, 1988, Ser. No. 445,843

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717935

Int. Cl.[5] F16H *5/36*

U.S. Cl. 74—335 **11 Claims**



1. A transmission system, especially for farm tractors, comprising:

a transmission shiftable in a standard H pattern connectable between an input shaft and an output shaft;

first gearing means forming a road travel group between said

shafts for coupling said shafts with each other through said transmission with a first set of forward drive speeds selectable by shifting of said transmission;

second gearing means forming a farming operation group between said shafts for coupling said shafts with each other through said transmission with a second set of forward drive speeds selectable by shifting of said transmission;

third gearing means forming a reverse drive group between said shafts for coupling said shafts with each other through said transmission with a set of reverse drive speeds selectable by shifting of said transmission;

a gear box receiving said transmission and said gear means;

a manual gear-selection lever operatively connected to said gearbox and shiftable in said pattern to select said drive speeds;

a servocontrol selector on said gear-selection lever for selecting amoung said groups; and

a gear-shift mechanism on said gearbox and including:

an electrohydraulic control unit responsive to electrical signals from said servocontrol selector for selecting among said groups,

a power-assisted servo unit hydraulically responsive to said control unit for operating said gearing means, and

coupling means connecting said manual gear-selection lever to said transmission for manual selection of gears thereof.

5,067,363

CLEARANCE-FREE SPINDLE DRIVE

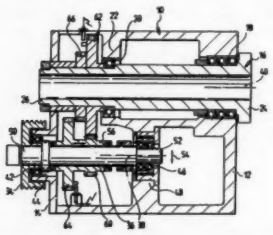
Dietmar F. Hafla, Hohengehren, Fed. Rep. of Germany, assignor to Index-Werke GmbH & Co. KG Hahn & Tessky, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 579,353

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1989, 3930334

Int. Cl.[5] F16H *35/08*

U.S. Cl. 74—392 **22 Claims**



1. A spindle drive for machine tools, comprising a housing, a spindle mounted in said housing, a drive motor arranged on said housing and a gear arranged in said housing and comprising an intermediate shaft driven by said drive motor and mounted in said housing via two shaft bearings spaced from one another as well as a first gear wheel seated on said intermediate shaft, wherein for driving said spindle as C-axis said first gear wheel engages in a first position with a second gear wheel driving said spindle so as to mesh with said second gear wheel without clearance, characterized in that said first shaft bearing (**42**) fixes one position of said intermediate shaft (**56**) immovably on said housing (**10**) in a direction transverse to its axis (**38**) and that said intermediate shaft (**56**) is adapted to be moved back and forth by said second shaft bearing (**46**) relative to said second gear wheel (**62**) in an adjusting direction (**54, 54'**) between said first position and a second position, the gear wheels (**60, 62**) meshing with one another in said second position with clearance.

5,067,364

DEVICE FOR ELIMINATING RATTLE IN A GEAR BOX

Grzegorz Janiszewski, Angered, Sweden, assignor to AB Volvo, Gothenburg, Sweden

PCT No. PCT/SE89/00233, § 371 Date Dec. 20, 1989, § 102(e) Date Dec. 20, 1989, PCT Pub. No. WO89/10504, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 26, 1989, Ser. No. 438,406

Claims priority, application Sweden, Apr. 26, 1988, 8801557

Int. Cl.[5] F16H *55/18*

U.S. Cl. 74—440 **3 Claims**

1. In a device for reducing mechanical rattle between a pairt of interengaging gears, comprising a gear element cooperating with one gear, said gear elements being rotatably mounted on a hub portion joined to said one gear having the same tooth profile and number of teeth as said one gear and being connected to said one gear via rotationally resilient elements, which are pre-tensioned in an engagement position of gears; the improvement wherein said resilient elements comprise elastic elements (**13**; **20**) which are disposed in opposing, circumferentially spaced cavities (**11, 12**) in said hub portion (**9**) and in a circumferentially inner surface of said gear element (**8**) that faces said hub portion (**9**) disposed to keep said gear elements and said one gear angularly displaced relatively to each other before they are brought into engagement with the other of said pair of interengaging gears, said cavities (**12**) in said portion (**9**) being arcuate, as viewed in a radial plane, while said cavities (**11**) in said gear element (**8**) have a first limiting surface (**11*a***) which is tangential relative to a circumference of the hub, and a second limiting surface (**11*b***) which extends essentially perpendicular to and radially inward from a radially outer end of said first limiting surface.

5,067,365

ADJUSTING MECHANISM FOR A CONTROL MEMBER

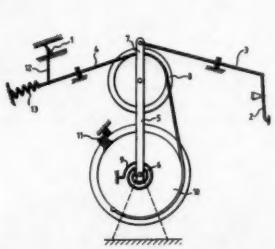
Peter Lauer, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 5, 1990, Ser. No. 505,872

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3910909

Int. Cl.[5] F16C *1/10*; G05G *1/14*

U.S. Cl. 74—501.5 R **16 Claims**



1. An adjusting mechanism for a control member which

influences automotive vehicle engine torques, said mechanism comprising:

an actuating member;

a control member;

a first pulley;

a second pulley;

a lever extending between the rotation axes of said first and said second pulleys;

a first connecting link coupled between said actuating member and said lever;

and a second connecting link coupled between said control member and said second pulley and wrapped around portions of said first and said second pulleys.

5,067,366

SERVO-ASSISTED DEVICE FOR OPERATING A VEHICLE PARKING BRAKE

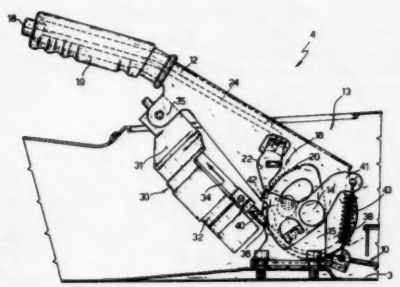
Romolo Gandiglio, Villanova D'Asti, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jun. 29, 1990, Ser. No. 545,715

Claims priority, application Italy, Jul. 28, 1989, 67646 A/89

Int. Cl.[5] G05G *5/06*; F16D *65/14, 19/00*

U.S. Cl. 74—535 **18 Claims**



1. A servo-system device for operating a vehicle parking brake, comprising:

a) a support bracket including a pivot;

b) a control lever rotatably secured to said pivot and operably associated with one end of a tension wire of a vehicle parking brake for actuating the tension wire;

c) a ratchet mechanism adapted to permit rotation of said control lever in a predetermined direction;

d) means for disengaging the ratchet mechanism;

e) an actuator adapted to cause the tension wire to be tensioned independently of said control lever;

f) said actuator being disposed between said control lever and the one end of the tension wire such that said control lever, said actuator and the tension wire form a chain in which said actuator is disposed mechanically in series, thereby permitting said control lever to actuate the tension wire independently of said actuator;

g) said actuator comprising an outer body pivotally connected to and disposed underneath said control lever; and,

h) said actuator including a movable element carried by said outer body and connected to the one end of the tension wire for actuating the tension wire when said movable element is displaced.

5,067,367

STEERING WHEEL

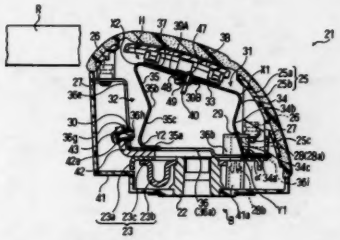
Takahiro Hashiba, and Kouichi Kaga, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 20, 1989, Ser. No. 438,269

Claims priority, application Japan, Nov. 30, 1988, 63-156378[U]

Int. Cl.[5] B62D *1/04*; B60R *21/05*

U.S. Cl. 74—552 **6 Claims**



1. A steering wheel comprising:

a ring portion;

a boss portion having a boss and disposed substantially at the center of said ring portion;

a spoke portion connecting said boss portion and said ring portion;

a pad, a front side of said pad being lower than a rear side thereof, said pad being disposed above said boss portion; and

an impact energy absorber composed of a deformation portion having a substantially inverted U-shape and a base portion connected to a lower end of said deformation portion, said impact energy absorber being disposed between said pad and said boss,

said deformation portion including an upper wall portion inclining to a front side, leg portions extending downwardly from front and rear edges of said upper wall portion and a bending portion defined respectively at lower ends of said front and rear leg portions and being connected to said base portion,

said front leg portion and said rear leg portion being provided with buckling points at substantially vertical midportions thereof and being buckled to extend inwardly of said impact energy absorber,

an intersection of said front leg portion and said bending portion being substantially vertically below and in a vertical plane of an intersection between said upper wall portion and said front leg portion, and

said bending portion defined at said lower end of said front leg portion being bent towards a front side of said impact energy absorber at an obtuse angle to a portion of said front leg portion below said buckling point of said front leg portion.

5,067,368

PEDAL MECHANISM FOR SEWING MACHINE DRIVE DEVICE

Tadakatsu Itakura, and Tatsuya Sawato, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 449,217

Claims priority, application Japan, Dec. 24, 1988, 63-326720

Int. Cl.[5] G05G *1/14*; D05B *69/14*

U.S. Cl. 74—560 **10 Claims**

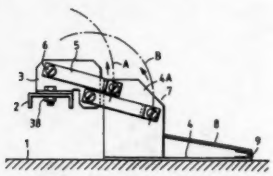
1. A pedal mechanism for a sewing machine drive device, comprising:

(a) a support member fixedly mounted on a support plate extending horizontally between legs of a sewing machine table;

(b) a pedal mounting base mounted adjacent to said support plate, a foot-operated pedal being mounted on said pedal

mounting base, said pedal transmitting an operation signal to a sewing machine controller when said pedal is pressed down; and

(c) a pair of connecting members for connecting said support member and said pedal mounting base, said connecting



members being attached to sides of said pedal mounting base which are perpendicular to said support plate, so as to move said pedal mounting base upward and downward while maintaining said base in a horizontal condition, so that said pedal mounting base can be placed on said support plate.

5,067,369

CERAMIC CAMSHAFT

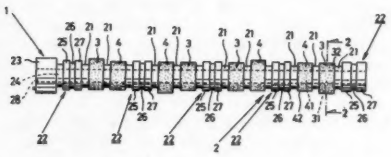
Masato Taniguchi, Nagoya, Japan, assignor to NGK Spark Plug, Nagoya, Japan

Filed Apr. 12, 1990, Ser. No. 538,310

Claims priority, application Japan, Apr. 12, 1989, 1-42577[U]

Int. Cl.[5] F16H *53/00*; F01L *1/04*

U.S. Cl. 74—567 **3 Claims**



1. A camshaft structure comprising:

a plurality of axially aligned shaft portions, each of which is made of metallic material; and

cylindrical cam portions each made from a ceramic material, and alternately arranged between the shaft portions with end surfaces of the cam portions being integrally bonded to adjacent surfaces of the shaft portions by means of a thermal bonding agent which has been brazed.

5,067,370

VARIABLE CRANK PEDAL DRIVE FOR BICYCLES AND THE LIKE

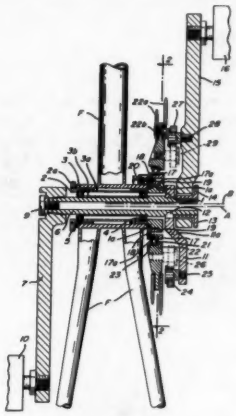
Joseph R. Lemmens, 6208 Sandy Forks Rd., Raleigh, N.C. 27615

Filed Jun. 13, 1989, Ser. No. 365,541

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.2 **7 Claims**

1. A drive system particularly useful for a foot-operated bicycle, comprising: a support, a pair of oppositely-directed input torque crank arms supported by said support, for rotation about a first axis independently of each other, an eccentric collar rotatably carried by said support, an output torque wheel rotatably carried by said collar for rotation about a second axis spaced from and parallel to said first axis, torque-transferring linkage means connecting each crank arm to said output torque wheel, said eccentric collar rotatably mounted on said support and means to releasably and adjustably lock



said eccentric collar in adjusted rotated position, so as to adjust the angular orientation of the plane containing said two axes.

5,067,371

METHOD AND APPARATUS TO CONTROL LOCKING OF A TOOL TURRET

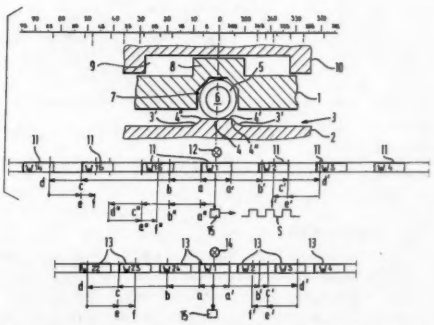
Willy Sauter, Reutlingen; Helmut Thumm, Metzigen; Rainer Wahl, Grafenberg, and Dieter Widmann, Neckartenzlingen, all of Fed. Rep. of Germany, assignors to Sauter Feinmechanik GmbH, Metzingen, Fed. Rep. of Germany

Filed Mar. 20, 1990, Ser. No. 496,019

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911522

Int. Cl.[5] B23Q *16/00*

U.S. Cl. 74—813 L **13 Claims**



3. An apparatus for controlling and synchronizing locking of a rotatable tool holder of a tool turret during rotation of the tool holder into different angular positions distributed uniformly around an entire periphery of the tool holder, comprising:

first and second driven parts coupled nonrotatably relative to the tool holder;

a driving part having coupling means for coupling said driving part to a drive motor so as to be rotated thereby, said driving part being coupled by form-locking means to said second driven part with backlash travel in rotary directions for rotary movement relative to said first and second driven parts between a first position in which the

tool holder is locked and a second position in which the tool holder is unlocked;

a cam surface with two different levels and follower elements engaging said cam surface located between said driven and driving parts for axial movement of said driving part relative to one of said first and second driven parts; and

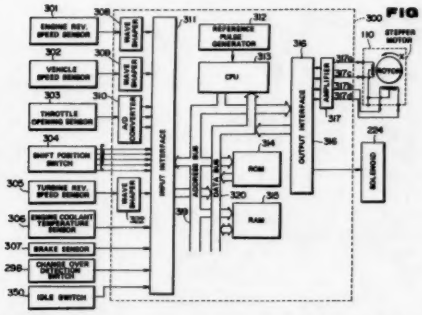
a rotating transmitter coupled to said driving part for simultaneous rotation therewith, said rotating transmitter including a signal transmitter producing one digital control signal for each angular position of the tool holder which can be selected, each said signal having a middle aligned with a middle of one level portion of said cam surface and having flanks aligned with level changes in said cam surface for locking and unlocking of the tool holder.

5,067,372

CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION

Yutaka Suzuki, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 7, 1990, Ser. No. 563,309
Claims priority, application Japan, Aug. 11, 1989, 1-206668
Int. Cl.[5] B60K *41/12*
U.S. Cl. 74—866 **5 Claims**



FIG

1. A control system for a continuously variable transmission for a motor vehicle having an accelerator and an engine, the continuously variable transmission including a hydrokinetic torque transmitting unit having an input element coupled with the engine and an output element, the hydrokinetic torque transmitting unit having a hydraulically operated lock-up mechanism having a lock-up state where the input element and a lock-up release state where the input element is fluidly connected with the output element, the continuously variable transmission being continuously variable between a maximum reduction ratio and a minimum reduction ratio, the control system comprising:

means for detecting operating variables which the motor vehicle is involved in and generating operating variables indicative signals indicative of said operating variables detected, said operating variables indicative signals including a vehicle speed indicative signal indicative of a vehicle speed of the motor vehicle;

a lock-up control valve having a lock-up position where the lock-up mechanism assumes the lock-up state thereof and a lock-up release position where the lock-up mechanism assumes the lock-up release state thereof;

a shift command valve including a spool movable within a normal stroke range between a minimum reduction ratio position and a maximum reduction ration position and also movable beyond said maximum reduction ratio position into an overstroke range next to adjacent to said normal stroke range;

means, including said shift command valve, for shifting the continuously variable transmission to a reduction ratio between the minimum reduction ratio and the maximum reduction ratio in response to a position which said spool of said shift command valve is moved to within said normal stroke range, but keeping the continuously variable transmission at the maximum reduction ratio during movement of said spool of said shift command valve within said overstroke range;

electromagnetic means for effecting a pressure regulation and generating a hydraulic fluid pressure signal;

said spool of said shift command valve including means for connecting said electromagnetic means to said lock-up control valve means to subject said lock-up control valve to said hydraulic pressure signal during movement of said spool within said normal stroke range and disconnecting said electromagnetic means from said lock-up control valve means to allow said lock-up control valve to assume said lock-up release position thereof during movement of said spool within said overstroke range; and

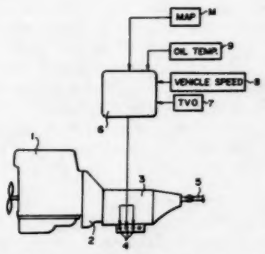
means for holding said spool of said shift command valve within said overstroke range until said vehicle speed indicative signal exceeds a predetermined vehicle speed value after a driver's demand for moving the motor vehicle from a standstill, and subsequently shifting said spool of said shift command valve from said overstroke range to said normal stroke range when said vehicle speed indicative signal exceeds said predetermined vehicle speed value.

5,067,373

AUTOMATIC-TRANSMISSION CONTROL SYSTEM

Takahiro Kyohzuka, and Toshiyuki Kikuchi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Jan. 5, 1990, Ser. No. 461,282
Claims priority, application Japan, Jan. 10, 1989, 1-3251
Int. Cl.[5] B60K *41/04*
U.S. Cl. 74—866 **9 Claims**



6. An automatic-transmission control system for controlling a gear speed to be shifted according to a gear shifting pattern in which the gear speed to be shifted is determined according to at least engine load and vehicle speed conditions, said automatic-transmission control system comprising:

a gear-shifting limiting means for allowing an automatic transmission, when a jump upshift from a certain gear speed to a final gear speed higher than the certain gear speed by two or more stages is required, to shift to an intermediate gear speed for a predetermined time interval and then shift to the final gear speed irrespective of controlling by said gear shift pattern; and

a limit release means for allowing the automatic transmission to directly upshift to the final gear speed without once shifting to the intermediate gear speed when the jump upshift is required while the vehicle speed is not lower than a predetermined value.

5,067,374
VEHICLE AUTOMATIC TRANSMISSION CONTROL SYSTEM

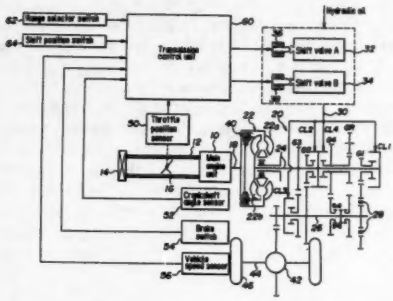
Ichiro Sakai; Yasuhisa Arai; Masataka Yamamoto, and Hiroki Matsui, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 439,298

Claims priority, application Japan, Nov. 18, 1988, 63-291702; Nov. 18, 1988, 63-291705

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **19 Claims**



1. A system for controlling a gear-ratio of an automatic transmission in a vehicle, comprising:

first means for determining parameters relating to operating conditions of the vehicle including degree of throttle opening and vehicle speed;

second means for establishing a membership function of a fuzzy set of at least one of the determined parameters in accordance with a first set of at lest one fuzzy production rule defining a respective conclusion for adjusting at least one of said determined parameters and for carrying out a first fuzzy reasoning based on said first set of fuzzy production rules to adjust at least one of said determined parameters;

third means for establishing another membership function of a fuzzy set of at least one of the determined or adjusted parameters in accordance with a second set of fuzzy production rules defining respective gear ratio shifting conclusions and for carrying out a second fuzzy reasoning based on said second set of fuzzy production rules to determine a gear ratio to be engaged; and

actuator means for driving a gear ratio shift mechanism in response to the determine gear ratio.

5,067,375
POWER OPERATED WIRE STRIPPER

Eric H. Wolter, Rockford, and James A. Wennemar, Sycamore, both of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed Nov. 15, 1990, Ser. No. 613,993

Int. Cl.[5] H02G *1/12*

U.S. Cl. 81—9.42 **3 Claims**

1. A power operated stripper for removing insulation from the ends of electric wires, comprising:

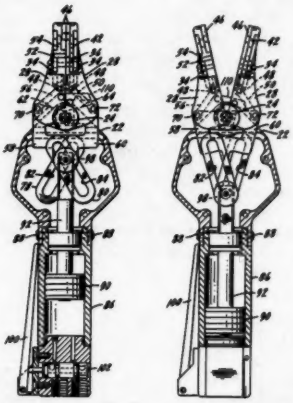
a housing;

a power cylinder connected to one end of the housing, a piston in the power cylinder, and a piston rod connected to the piston and extending therefrom in a defined direction into the housing;

first and second levers pivotally mounted on a common pivot on the other end of the housing, extending in the defined direction away from the housing and arranged to perform a pivoted opening and closing action relative to each other in a direction generally at right angles to the defined direction;

a pair of clamping jaws on one lever and a pair of stripping jaws on the other constructed to open and close on an insulated wire placed between them;

first and second links each having an opening for pivotally mounting the links on said common pivot, the first and second links also each having a downward extension which joins a cam portion, the cam portions defining cam slots which extend at oppositely-directed angles to the defined direction, the links being mounted one on top of the other so that the cam slots overlap one another;



third and fourth links pivotally connecting the first and second links to the first and second levers; and

a cam roller connected to the piston rod and disposed in both cam slots such that linear translation of the piston causes pivoting of the first and second links about the common pivot, thereby causing the third and fourth links to open and close the jaws and to open and close the levers upon operation of the power cylinder.

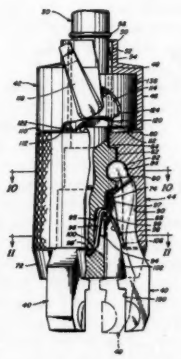
5,067,376
ADJUSTABLE EXTENSION WRENCH FOR RATCHET DRIVE

Gregory Fosella, 97 Main St., Osterville, Mass. 02655

Filed Aug. 10, 1989, Ser. No. 392,206

Int. Cl.[5] B25B *13/32*

U.S. Cl. 81—115 **16 Claims**



1. An adjustable wrench comprising;

a drive shaft having a longitudinal axis and an input and an output end,

a ratchet housing keyed to the drive shaft for rotation there-

with and open at one end facing in the direction of the output end of the shaft,

a second housing mounted on and surrounding the shaft beyond said one end of the ratchet housing, said second housing being rotatable on and with respect to the shaft,

pivot recesses formed by the second housing and the shaft,

a plurality of jaws having pivot heads at one end pivotally mounted in the pivot recesses between the shaft and the second housing and having gripping pads at their opposite ends for engaging a work piece movable toward and away from the longitudinal axis of the shaft and positioned beyond the output end of the shaft and extending out of the second housing,

springs engaging each of the jaws and biasing them away from one another,

a plurality of cam surfaces formed on the second housing and engaging the jaws below the pivot heads for pivoting the jaws inwardly toward the axis against a workpiece when the second housing is rotated on the shaft in one direction,

and a two position ratchet mechanism in the ratchet housing including a manually operated control lever, said mechanism in one position enabling the second housing to rotate in one direction with respect to the shaft to move the jaws toward the axis and in a second position enabling the second housing to rotate in the opposite direction to move the jaws away from the axis under the influence of the springs.

5,067,377

METHOD OF MANUFACTURING A MASTER FOR THE FABRICATION OF PROJECTION SCREENS AND TOOL FOR CARRYING OUT THE METHOD

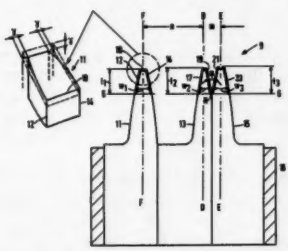
Marinus J. J. Dona, and Johannes M. M. Swinkels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 371,680, Jun. 22, 1989, Pat. No. 4,955,937, which is a continuation of Ser. No. 134,667, Dec. 18, 1987, abandoned. This application May 15, 1990, Ser. No. 524,253

Claims priority, application Netherlands, Oct. 7, 1987, 8702384

Int. Cl.[5] B23G *5/02*

U.S. Cl. 82—138 **2 Claims**



1. A chisel for manufacturing a master for the fabrication of projection screens, the chisel being of multiple construction and being composed of three subchisels, a precutting chisel, a cutting chisel and a finishing chisel, characterized in that the distance between the median planes of the cutting chisel and the precutting chisel is a multiple of the distance between the median planes of the cutting chisel and the finishing chisel, and in that the distance between the median planes of the cutting chisel and the finishing chisel is equal to the pitch distance between the grooves to be cut, so that during operation the two flanks of a rib being formed are tooled simultaneously, whereby the rib is supported at the two flanks by the cutting chisel and the finishing chisel and is loaded substantially uniformly so that undesired deformations of the rib in the transverse direction are avoided.

5,067,378

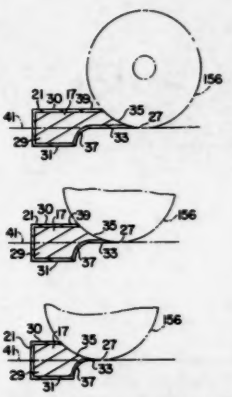
BLADE FOR CUTTING SHEET MATERIAL AND RELATED CUTTING METHOD

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Division of Ser. No. 370,649, Jun. 23, 1989, Pat. No. 4,991,481. This application Nov. 28, 1990, Ser. No. 619,296

Int. Cl.[5] B26D *7/27*; D06H *7/00*

U.S. Cl. 83—13 **2 Claims**



1. A method for cutting sheet material, said method comprising the steps of:

providing a cutting blade comprised of an elongated piece of base material having a lower cutting part extending along a longitudinal axis which cutting part has a forward cutting edge providing portion and a rear body portion, said body portion having first and second generally flat side faces parallel to and spaced from one another, said cutting edge providing portion having first, second, third and fourth side surfaces, said first side surface being located on a middle reference plane parallel to and located substantially mid-way between said first and second side faces of said body portion, said fourth side surface being located in the same plane as the first side face of said body portion, said second side surface being inclined relative to said reference plane, extending between said first side surface and said fourth side surface and intersecting said first side surface to define a cutting edge extending parallel to said longitudinal axis, and said third side surface extending from the rear of said first side surface to said second side face of said body portion and being inclined relative to said reference plane, at least said first side surface of said cutting edge providing portion being covered with a thin layer of hard material harder than that of said base material,

providing a quantity of sheet material spread on and supported by a supporting surface,

cutting said sheet material by reciprocating said blade along an axis of reciprocation generally parallel to said longitudinal axis and generally perpendicular to said sheet material and moving said blade forwardly along a desired line of cut to cut said sheet material while said cutting edge is in cutting engagement with said sheet material, and

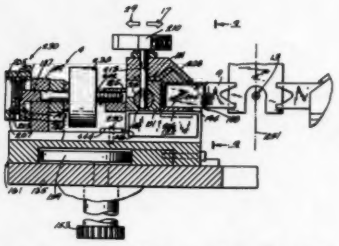
periodically sharpening said cutting portion of said blade by grinding only said second side surface so as to cause said cutting edge to be defined substantially entirely by said hard material, said cutting edge as a result of repeated grindings of said second side surface gradually moving rearwardly toward said body portion and remaining on said middle reference plane.

5,067,379

ELECTRONIC DISPLAY SYSTEM FOR WIRE STRIPPING MACHINE

John D. Butler, Germantown, and Vinod K. Chopra, Brookfield, both of Wis., assignors to Mechtrix Corporation, Menomonee Falls, Wis.

Filed Mar. 20, 1989, Ser. No. 325,435
Int. Cl.[5] H02G 1/12
U.S. Cl. 83—13 28 Claims



1. A method of setting blades for circumferentially cutting the insulation of an insulated electrical conductor to a selected diameter of insulation cut comprising the steps of:

providing left and right yokes adapted to reciprocate perpendicularly toward and away from the insulated electrical conductor;

providing respective tool holder assemblies on the left and right yokes, each tool holder assembly being translatable perpendicular to the insulated electrical conductor along the respective yoke;

clamping blades in the respective tool holder assemblies for closing and opening over the insulated electrical conductor as the yokes reciprocate toward and away therefrom, the blades cooperating when closed to a true zero position to define a theoretical optimum blade cutting hole diameter;

translating the left and right tool holder assemblies and respective blades and simultaneously sensing and displaying selected information representing positional information of the blades relative to the true zero position;

the step of translating the blades and simultaneously sensing and displaying selected information comprising:

translating each tool holder assembly away from the true zero position to predetermined home positions equidistant from the true zero position; and

sensing and displaying selected information representative of the blade home positions.

5,067,380

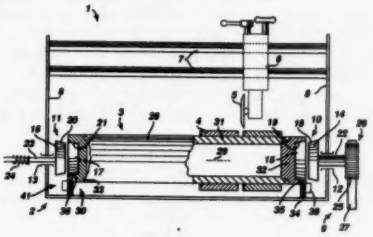
CUTTING MECHANISM FOR MATERIALS IN WEB OR LAYER FORM

Joachim Seefeldt, Neuffen, Fed. Rep. of Germany, assignor to bielomatik Leuze GmbH & Co., Fed. Rep. of Germany

Filed Mar. 2, 1990, Ser. No. 487,544
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 3908010
Int. Cl.[5] B26D 1/22
U.S. Cl. 83—481 29 Claims

1. a cutting mechanism for web or layer materials comprising:

a base a cutting roller having roller ends and mounted on said base in a vicinity of said roller ends in an operating position at least one rapid assembly coupling having operationally disengageable first and second coupling members for mounting and detaching at least one associated section of said cutting roller by moving at least one of said first and second coupling members in an axial coupling movement, and drive means providing a drive connection for driving said cutting roller, via a disengageable drive engagement of disconnectably interengaging first and second drive faces, said first and second drive faces defining a disengagement movement provided for disengaging said first drive faces from said second drive faces,



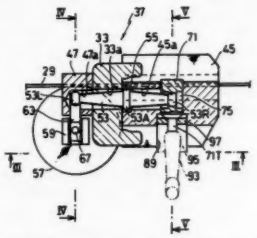
wherein at least one of said drive faces is operationally displaceably mounted on said base to perform said disengagement movement with respect to said base, said disengagement movement being an axial movement.

5,067,381

VIBRATION PREVENTION DEVICE FOR BANDSAW MACHINES

Kenji Ohnishi, Isehara; Isomi Washio, Hatano, and Koji Nakano, Odawara, all of Japan, assignors to Amada Company, Limited, Japan

Division of Ser. No. 156,819, Feb. 17, 1988, Pat. No. 4,972,746.
This application Aug. 2, 1990, Ser. No. 561,824
Claims priority, application Japan, Feb. 18, 1987, 62-21427
Int. Cl.[5] B23D 55/08
U.S. Cl. 83—820 2 Claims



1. A bandsaw blade guide device which is mounted on one end of the bandsaw guide arm for guiding the bandsaw blade that runs between a pair of bandsaw blade wheels, comprising:

a first supporting member which is mounted on guide arm and is free to contact one side surface of the bandsaw blade;

a second supporting member which is mounted on the guide arm facing the first supporting member across the bandsaw blade and is free to contact a first portion of the other side surface of the bandsaw blade;

a third supporting member comprising a roller which is mounted on the guide arm, separated from the second supporting member along a direction of travel of the bandsaw blade and is free to contact a second portion of the other side surface of the bandsaw blade;

a fourth supporting member comprising a roller which is mounted on the guide arm facing the third supporting member across the bandsaw blade and is free to contact the one side surface of the bandsaw blade; and

a pressure applying means mounted on the guide arm for applying pressure to the second supporting member and the third supporting member separately to hold the bandsaw blade between the first and the second supporting member and the third and fourth supporting members, respectively, the pressure applying means applying a

pressure to the third supporting member higher than 40% of that applied to the second supporting member; and

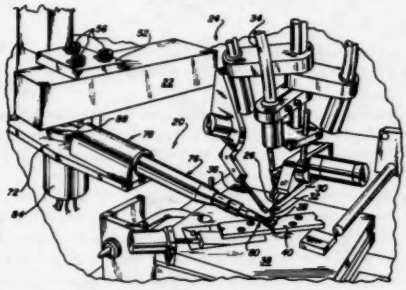
said third and fourth supporting members being positioned upstream of said first and second supporting members, wherein the pressure applying means comprises: a first hydraulic cylinder for pressing the second supporting member against the first supporting member; a lever for pressing the third supporting member against the fourth supporting member; and a second hydraulic cylinder to actuate said lever.

5,067,382

METHOD AND APPARATUS FOR NOTCHING A LEAD WIRE ATTACHED TO AN IC CHIP TO FACILITATE SEVERING THE WIRE

Eckehart Zimmerman, and Thomas A. Thorson, both of Colorado Springs, Colo., assignors to Cray Computer Corporation, Colorado Springs, Colo.

Filed Nov. 2, 1990, Ser. No. 608,258
Int. Cl.[5] B26D *3/14*
U.S. Cl. 83—879 **29 Claims**



27. A method of forming a notch in a wire with a pair of spaced apart cutting blades to facilitate a subsequent separation of the wire by applying linear tensile separation force to a remaining portion of the wire at the notched location, comprising the steps of:

moving the cutting blades for reciprocative movement toward and away from each other,

moving the blades into and out of straddling relationship with the wire,

moving the blades into straddling relationship with the wire,

subsequently moving the blades into notching engagement with the wire to leave a remaining portion of the wire at the notched location,

removing the blades from notching engagement with the wire after creation of the remaining portion, and

removing the blades from straddling engagement with the wire.

5,067,383

DRIVE ADAPTER FOR FIREARM CARTRIDGE RELOADER

Ransom Rowe, Sarasota, Fla., assignor to K&R Manufacturing, Inc., Hasting-on-Hudson, N.Y.

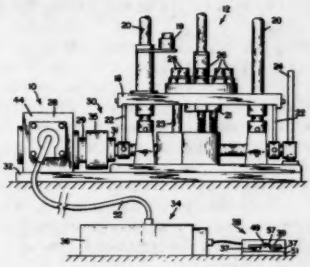
Filed Jan. 8, 1991, Ser. No. 638,758
Int. Cl.[5] F42B *33/02*
U.S. Cl. 86—23 **11 Claims**

1. A drive adaptor for a firearm cartridge reloader which includes a frame and a horizontal drive shaft which is mounted on the frame for oscillation about its central longitudinal axis for providing the actuating functions of the reloader, said adaptor comprising:

(a) a fluid pump,

(b) a double acting fluid oscillator which has an output shaft and two fluid driven actuating elements, one of said actuating elements being effective to rotate said output shaft in a clockwise direction and the other of said actuating elements being effective to rotate said output shaft in a counter clockwise direction,

(c) a base for supporting the reloader and the oscillator so that the oscillator is maintained in a fixed position relative to the reloader,



(d) coupling means for operatively connecting said output shaft to said horizontal shaft for clockwise and counter clockwise rotation of said horizontal shaft when viewed from one end, and

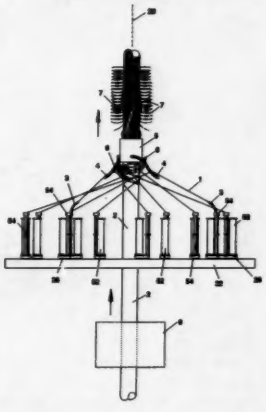
(e) fluid control means for selectively connecting said actuating elements to said fluid pump for selective clockwise and counterclockwise rotation of said horizontal shaft.

5,067,384

BRAIDER METHOD AND APPARATUS FOR MANUFACTURED FAIRED ROPE OR CABLE

Eraldus Scala, Ithaca, N.Y., assignor to Cortland Cable Company, Inc., Cortland, N.Y.

Filed Jan. 23, 1989, Ser. No. 299,774
Int. Cl.[5] D04C *3/10*
U.S. Cl. 87—6 **2 Claims**



1. A method of manufacturing an elongated structure having a core and a plurality of flexible members extending outwardly from the core at spaced intervals along its length, as the advancing core moves up through a common axis of two endless sinusoidal paths of a plurality of moving bobbins with the direction of movement of the bobbins in each sinusoidal path being in the opposite direction and the bobbins in each path being maintained evenly distributed through 360 degrees and with each bobbin paying out threads through thread tensioning means for braiding thread material around the said elongated structure having a core as the elongated structure advances

upwardly along the common axis with the plurality of flexible members extending outwardly from the core being obtained by the following steps:

(a) raising the level upward of the thread leaving the thread tensioning means associated with at least one bobbin paying out thread to provide the flexible members extending laterally outward from the core by adding a spooler guide extension upward for the thread leaving the thread tensioning means;

(b) catching the thread leaving the said thread tensioning means via the spooler guide extension by disposing a hook, above the plural bobbins and associated thread tensioning means moving along the said sinusoidal paths in opposite directions, at a radial angle location corresponding to the point on the circumference of where the operator wishes the flexible members extending laterally outward from the core to be located and at a height at which the hook will catch the thread coming off of the spooler guide extension but not the other thread tensioning means associated with the other bobbins moving in the two sinusoidal paths;

(c) and as said plurality of bobbins and thread tensioning means continue to move along the sinusoidal paths in opposite directions the thread so hooked moves up the inclined plane of the hook continuing to become an integral part of the braid over said core and the loop formed by the portion of the thread which does not become a part of the braid moves toward the top of the hook that reaches a point that the loop of thread is cut forming the laterally extended threads at the selected point of the circumference of the core determined by the aforesaid radial angle selected for the hook.

5,067,385

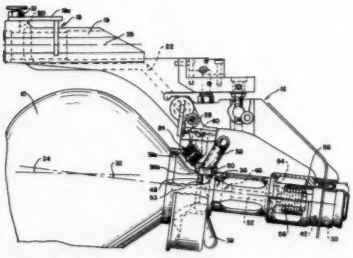
METHOD AND APPARATUS FOR ALIGNING SPIN-STABILIZED SELF-PROPELLED MISSILES

Michael F. Steele, Fountain Valley, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 19, 1990, Ser. No. 554,556

Int. Cl.[5] F41C *27/06;* **F41F** *3/048;* **F42B** *10/26*

U.S. Cl. 89—1.808 **18 Claims**



7. For use with a launching apparatus for a spin-stabilized self-propelled missile, which includes rotary missile support means defining a spin axis and receiving the missile with a missile axis of rotation, and connection means operative to hold the missile on the support means, a method of aligning the missile axis of rotation with said spin axis, comprising the steps of:

supporting the rotary missile support means and missile on a fixture for rotation about said spin axis;

rotating the rotary missile support means and missile relative to the fixture about said spin axis;

determining the amount of eccentricity between the missile axis of rotation and said spin axis;

adjustably moving the missile relative to the rotary support means to coincidently align the missile axis of rotation with said spin axis; and

tightening said connection means to maintain said coincident alignment of the axes.

5,067,386

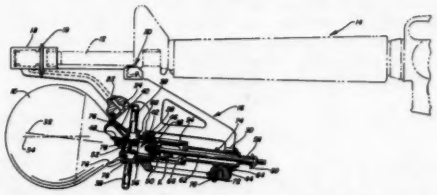
RELEASE APPARATUS FOR SPIN STABILIZED SELF-PROPELLED PROJECTILES

Nathan N. Shiovitz, Anaheim; John G. Maloney, Diamond Bar, and Michael F. Steele, Fountain Valley, all of Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 18, 1988, Ser. No. 195,657

Int. Cl.[5] F41C *27/06;* **F41F** *3/048, 3/052*

U.S. Cl. 89—1.808 **20 Claims**



1. A release mechanism for facilitating launching a spin-stabilized self-propelled missile, comprising:

a missile;

missile support means including rotary means having receptacle means defining a spin axis, and fixed support means for supporting the rotary means for rotation about the spin axis and for movement axially of the spin axis;

nozzle means adapted to extend from the missile into said receptacle means, including fusible joint means for heating by high-temperature exhaust gases expelled by the missile to release the missile, and an aft nozzle section movable away from the missile on fusing and separation of the fusible joint means; and

abutment means on the rotary means in the path of movement of the aft nozzle section for striking by the aft nozzle section to effect rapid movement of the rotary means and receptacle means axially away from the missile on fusing and separation of the fusible joint means.

5,067,387

RAIL GUNS

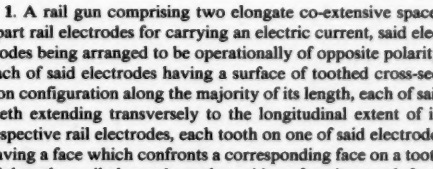
Graham A. Reynolds, Coventry, England, assignor to Rolls-Royce plc, England

Filed Aug. 28, 1990, Ser. No. 573,996

Claims priority, application United Kingdom, Oct. 13, 1989, 8923126

Int. Cl.[5] F41B *6/00*

U.S. Cl. 89—8 **7 Claims**



1. A rail gun comprising two elongate co-extensive spaced apart rail electrodes for carrying an electric current, said electrodes being arranged to be operationally of opposite polarity, each of said electrodes having a surface of toothed cross-section configuration along the majority of its length, each of said teeth extending transversely to the longitudinal extent of its respective rail electrodes, each tooth on one of said electrodes having a face which confronts a corresponding face on a tooth of the other rail electrode so that said confronting tooth faces are parallel, each of said confronting tooth faces being copla-

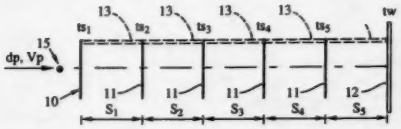
nar with the confronting faces of the remaining teeth on its respective rail electrodes.

5,067,388

HYPERVELOCITY IMPACT SHIELD

Jeanne L. Crews, Arcadia, and Burton G. Cour-Palais, Houston, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1990, Ser. No. 516,573
Int. Cl.[5] F41H *5/04*
U.S. Cl. 89—36.02 **10 Claims**



1. A hypervelocity impact shield for protecting a wall structure from impact with particles of matter having impact velocities up to 16 km/s and densities of about 2.7 g/cm^3, said impact shield being mounted over said wall structure in a position to intercept said particles of matter and comprising an array of ultra thin sheets of impactor disrupting material, means for supporting and maintaining said sheets in a spaced relationship to one another and to said wall where the outermost sheet of impactor disrupting material which is first impacted by said particle of matter produces fragmentation and scattering of the impacting material and a debris plume of liquid and vapor from the impacting material and the sheet material, and where each of the sheets between the outermost sheet and the wall structure has a thickness such that the ratio of sheet thickness to the diameter of said particles of matter which may be of spherical form or to the length of cylindrical particles of said matter is in the range of 0.03 to 0.05 and wherein the spacing between adjacent sheets is arranged so that the debris plume resulting from impacting material penetrating a sheet does not puncture the next adjacent sheet prior to the arrival of material and shield particulates at such adjacent sheet, said sheets being of a number and spacing such that said impacting material and the resulting particulates thereof are successively impact shocked by the sheets to a state of total melt and/or vaporization prior to reaching said wall structure.

5,067,389

LOAD CHECK AND PRESSURE COMPENSATING VALVE

Gene R. St. Germain, Plainfield, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Aug. 30, 1990, Ser. No. 574,864
Int. Cl.[5] F15B *11/08*
U.S. Cl. 91—446 **9 Claims**

1. A control valve for use in a hydraulic system having at least one other control valve therein, at least one hydraulic motor connected to each of the control valves, and a load pressure signal network operatively connected to the motors and having a control pressure line which receives the highest load pressure occurring at the motors, said control valve comprising:

an inlet port;

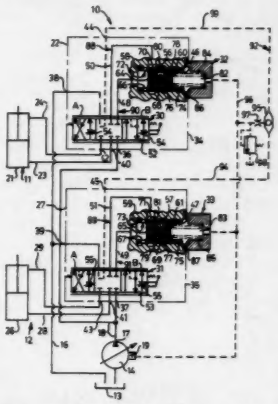
a pair of service passages connectable to the associated hydraulic motor;

a valve member movable in opposite directions from a neutral position to infinitely variable operating positions;

a load check and pressure compensating valve element movable from a load check position to an infinitely variable operating position;

means defining a flow control flow path from the inlet port to one of the service passages when the valve member and the valve element are at operating positions, the flow path including a metering orifice and a pressure control orifice disposed in series flow relationship downstream of the metering orifice with the size of the metering orifice being determined by the extent to which the valve member is moved from the neutral position and the size of the control orifice being determined by the extent to which the valve element is moved from the load check position, the valve element being moved to the operating position by fluid passing through the metering orifice;

a load piston normally biasing the valve element to the load check position;



a first variable volume chamber between the valve element and the load piston;

a second variable volume chamber defined in part by the load piston and adapted to be connected to the control pressure line;

a spring disposed in the second chamber biasing the load piston toward the valve element and hence the valve element to the load check position;

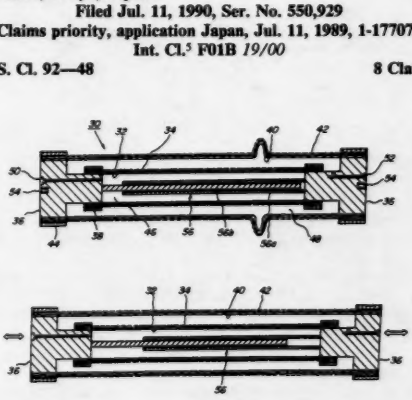
means for communicating load pressure from the one service passage into the first chamber.

5,067,390

DOUBLE-ACTING FLEXIBLE WALL ACTUATOR

Koichi Negishi, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 11, 1990, Ser. No. 550,929
Claims priority, application Japan, Jul. 11, 1989, 1-177073
Int. Cl.[5] F01B *19/00*
U.S. Cl. 92—48 **8 Claims**



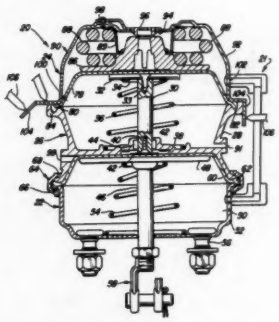
1. A double-acting actuator comprising a first tubular body

made of an elastic material, a first reinforcing braided structure surrounding the first tubular body, a second tubular body made of an elastic material surrounding the first reinforcing braided structure to form a space outwardly thereof, a second reinforcing braided structure surrounding the second tubular body, closure members for closing and joining ends of the first and second tubular bodies and reinforcing braided structures, and guide means for permitting axial movements of the first and second tubular bodies but restraining lateral movements thereof, said first reinforcing braided structure having initial braided angles permitting elongation movements of the first tubular body in axial directions on being supplied with a pressurized fluid thereinto and said second reinforcing braided structure having initial braided angles permitting contracting movements of the second tubular body in axial directions on being supplied with the pressurized fluid thereinto, thereby enabling the actuator to do reciprocative movements by supplying and exhausting the pressurized fluid into and from the respective tubular bodies.

5,067,391
TAMPER-RESISTANT BRAKE ACTUATOR

Graydon J. Choinski, Utica, Mich.; Allen L. Gummer, Santa Rosa, Calif., and David W. Brooks, Royal Oak, Mich., assignors to Indian Head Industries, Inc., Southfield, Mich.

Continuation of Ser. No. 118,372, Nov. 6, 1987, Pat. No. 4,960,036. This application Sep. 17, 1990, Ser. No. 583,795
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] F01B *19/00*
U.S. Cl. 92—48 **10 Claims**



1. A tamper-resistant fluid operated brake actuator comprising:

a flange case having a pair of opposed chamber portions defining portions of a spring chamber and a service chamber respectively, said flange case having an annular flange which extends generally radially outwardly from said portion defining part of said spring chamber;

a service chamber housing defining said service chamber with said flange case portion, a diaphragm received said service chamber housing and said flange case, a spring mounted between said service chamber housing and said service chamber diaphragm and biasing said service chamber diaphragm towards said flange case;

a head having an annular rim secured to said annular flange to define said spring chamber;

a spring chamber diaphragm disposed between said annular flange of said flange case and said annular rim of said head, a power spring piston mounted on said spring chamber diaphragm, a power spring mounted in contact with said power spring piston, and between said power spring piston and said head;

a second spring mounted between said spring chamber diaphragm and said flange case;

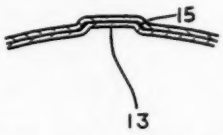
a push rod mounted in contact with said spring chamber diaphragm and extending through said flange case, into said service chamber and outwardly through said service chamber housing and adapted to be connected to a yoke assembly; and

a securing member securing said annular rim to said flange, said securing member having a portion radially aligned with said annular flange, and on a side of said spring chamber diaphragm spaced towards said head, said securing member being deformed beyond its elastic limit around said annular flange to retain said head in contact with said flange case such that said head is rigidly secured to said flange case by said securing member, whereby to remove said head from said flange case, said securing member must be deformed beyond its elastic limit.

5,067,392
PNEUMATIC BOOSTER

Jean-Pierre Gautier, Aulnay sous Bois, France, assignor to Bendix Europe Services Techniques, Drancy, France

Filed Aug. 16, 1990, Ser. No. 568,149
Claims priority, application France, Sep. 5, 1989, 89 11565
Int. Cl.[5] F01B *19/00;* **F16J** *3/00*
U.S. Cl. 92—98 D **2 Claims**

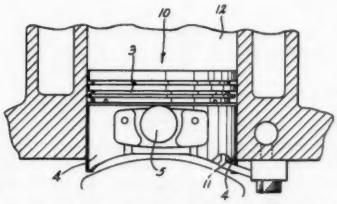


1. A pneumatic booster of the vacuum type, comprising a housing divided into two chambers by a movable wall structure comprising a substantially radial plate and a flexible diaphragm which is secured by an outer peripheral edge to said housing and forming a fold in a space between said plate and housing, said plate being centrally connected with a hub structure housing a distribution valve device and linked to a control member and to controlled member, said plate having at an outer edge thereof an extension cooperating in a non-leaktight manner with an internal wall of said housing in order to ensure axial guidance of said movable wall inside said housing, said extension being constructed of a plurality of fingers with at least one of said fingers engaging in a groove in said internal wall to prevent rotation of said plate.

5,067,393
PISTON HEAD BLOCK FOR INTERNAL COMBUSTION ENGINE

Isamu Kawasaki, and Kazunari Hirata, both of Kanagawa, Japan, assignors to Atsugi Motor Parts Company Limited, Kanagawa, Japan

Filed Aug. 23, 1989, Ser. No. 397,522
Claims priority, application Japan, Aug. 31, 1988, 63-114463
Int. Cl.[5] F01P *3/00*
U.S. Cl. 92—186 **11 Claims**



1. A piston for an internal combustion engine which has a lubricant injection nozzle, comprising:

a piston head block having a head section and a skirt section,

said skirt section being formed with a cut-out for receiving said lubricant injection nozzle at a piston stroke position in the vicinity of bottom-dead center in the piston stroke, said cut-out extending into said skirt portion; and

means for defining a clearance between an outer periphery of a lower edge portion of said skirt section containing said cut-out and an inner periphery of an engine cylinder wall, said clearance avoiding direct contact of said lower edge portion with said inner periphery of said cylinder wall so as to prevent a transverse force in a direction perpendicular to a piston stroke axis from being exerted on said lower edge portion where said cut-out is formed.

5,067,394

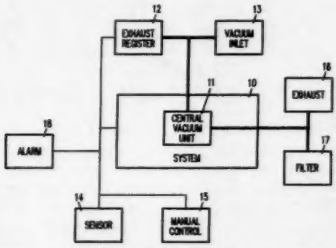
AIRBORNE PARTICLE EXHAUST SYSTEM

Thomas Cavallero, 5714 Maywood Dr., Foresthill, Calif. 95631

Filed Aug. 2, 1990, Ser. No. 562,036

Int. Cl.[5] F24F *11/00*

U.S. Cl. 98—42.03 **11 Claims**



1. A central vacuum cleaning device, incorporating a safety device, the safety device comprising:

means for detecting airborne particulants;

means responsive to said detecting means remotely locatable therefrom and for supplying a vacuum for operating said vacuum cleaning device as a safety device in response to said detecting means and for otherwise operating said vacuum cleaning device as a central vacuum cleaner;

means coupled to said vacuum means remotely locatable therefrom and for porting detected airborne particulants from a structure in response to said vacuum means when said vacuum cleaning device is operated in response to said detecting means as a safety device and for porting particles collected when said vacuum cleaning device is operated as a central vacuum cleaner;

means coupled to said vacuum means remotely locatable therefrom and for discharging said airborne particulants collected by said porting means at a collection or dispersal location when said vacuum cleaning device is operated in response to said detecting means as a safety device.

5,067,395

DEVICE FOR PREPARING HOT DRINKS

Eberhard Timm, Rahheideweg 15, D-2114 Appel, Fed. Rep. of Germany

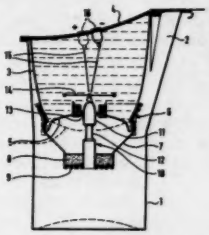
Filed Feb. 6, 1990, Ser. No. 475,682

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1989, 3903815; Mar. 3, 1989, 8902598[U]

Int. Cl.[5] A47J *31/10, 31/30;* A23F *5/26*

U.S. Cl. 99—282 **22 Claims**

1. Device for preparing hot drinks having a liquid-storage vessel, an electric heating element arranged therein, a current supply circuit and a collecting vessel for the prepared drink, characterized in that the liquid-storage vessel **3** is designed as a unit separate from the current supply circuit **17** and is closed by a valve **10–13** which opens irreversibly at a predetermined pressure inside he storage vessel, the storage vessel **3** being provided with contacts **16** for the supply of electric scent which are connected to he heating element **14** via and electric line **15**, and the storage vessel **3** being insertable into the collecting vessel **1** in an operative position in such a way that spa e defined by collecting vessel is situated essentially below the



storage vessel **3** and that the current feed to the heating element **14** is designed such that the current feed is interrupted when the valve **10–13** opens.

5,067,396

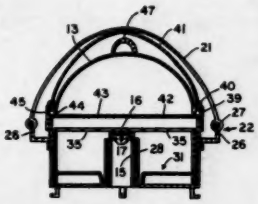
COOKING DEVICE WITH HEAT FUNNEL

Dent G. Sorensen, 80 N. 3rd East, Salina, Utah 84654, and Newell J. Hatch, Aurora, Utah 84620

Continuation-in-part of Ser. No. 389,731, Aug. 4, 1989, abandoned. This application Apr. 23, 1990, Ser. No. 514,407

Int. Cl.[5] A47J *27/12*

U.S. Cl. 99—340 **8 Claims**



1. A cooking device comprising

a pan having a continuous, upstanding side wall and a bottom wall, with the side wall forming an enclosure about an interior of the pan;

a top pending for the pan, said top opening being defined by the upper edge of said side wall;

a central opening in the bottom wall of the pan;

a tubular heat funnel having a continuous upstanding side wall, a top wall closing the top end of said heat funnel and an open bottom end attached to said bottom wall of said pan so that the opening in said bottom wall coincides with the open bottom of said heat funnel, said side wall of said heat funnel extending upwardly into the interior of the pan from the bottom wall to just below the top opening;

a plurality of openings in the side wall of said heat funnel, with the openings being spaced around the circumference of said side wall of said heat funnel, and with the openings further being positioned closely adjacent to the top wall of said heat funnel;

a flat griddle member positioned on the upper edge of said side wall of said pan such that the flat griddle forms a top for the interior of the pane as well as a cooking surface that is heated by heat rising through said heat funnel and then distributed uniformly about the flat griddle by the openings in the side wall of said heat funnel;

a curved first handle having opposite ends hingedly attached to the side wall of said pan at diametrically opposite locations on the side wall of said pan, whereby said first handle can be raised to a substantially vertical position lying in a vertical plane passing through the center, vertical axis of said interior of said pan, and further wherein said first

handle can be lowered to a position below the upper edge of said pan;

a pair of curved handles having opposite ends hingedly attached to an exterior surface of said griddle, with the opposite ends of each respective pair of second handles being displaced by an equal distance away from a center line through the griddle, with one pair of second handles being displaced on one side of said center line and with the other pair of second handles being displaced on the other side of said center line; and

said pair of curved handles are of a size and shape that when said griddle is positioned on the upper edge of said side wall and the pair of second handles are raised and rotated toward each other, the central portions of said second handles meet in an adjacent side-by-side relationship with each other and further lie in a close adjacent relationship with the central portion of said first handle when said first handle is raised to its vertical position,

whereby the pan and griddle positioned on the upper edge of said side wall of said pan can be lifted and moved as a stable unit by lifting the device at a common position formed by the adjacent central portions of said pair of second handles that lie in closed adjacent relationship to the central portion of said first handle.

5,067,397

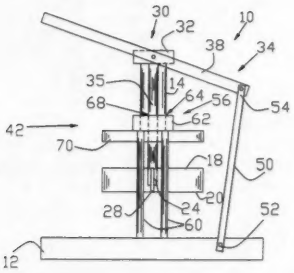
PINEAPPLE CUTTING AND CORING DEVICE

Daniel P. Healy, 10206 Bayport Rd., Louisville, Ky. 40299

Filed Mar. 28, 1991, Ser. No. 676,321

Int. Cl.[5] A23N *4/00, 4/20, 7/00, 7/08*

U.S. Cl. 99—542 **9 Claims**



1. A pineapple cutting and coring apparatus, comprising:

a cutting board base plate for supporting a pineapple in an upright position and for resisting a cutting force applied to the pineapple;

an inside cylindrical cutting blade for separating the core of a pineapple from the flesh of a pineapple located above and perpendicular to the cutting board;

an outside cylindrical blade disposed coaxially around the inner cylindrical blade for removing the shell from the flesh of the pineapple on the cutting board;

first and second diametrically opposed radially symmetric cutting blades extending outwardly from the outside cylindrical blade for splitting the outer shell of the pineapple into halves;

blade moving means for moving the concentric inside blade, outside blade and radial blades in unison downwardly toward and upwardly away from the cutting board; and

stationary blade guide means located a distance above the cutting board slidably engaging the outer perimeter of the inside cylindrical cutting blade for guiding the inside cylindrical cutting blade, outside cylindrical cutting blade and radial blades as they are moved downwardly toward and upwardly away from the cutting board.

5,067,398

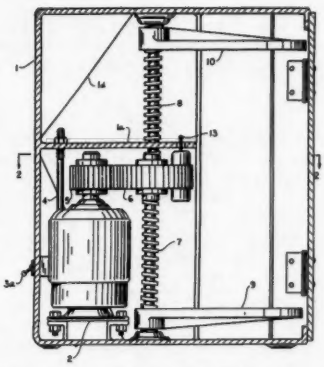
CAN CRUSHER

Norman E. Thoma, 112 Longmount Dr., Pittsburgh, Pa. 15214

Filed Sep. 11, 1989, Ser. No. 405,287

Int. Cl.[5] B30B *15/14, 1/18*

U.S. Cl. 100—53 **2 Claims**



1. A can crusher comprising a vertically extending container having a side door, a top wall, a bottom wall, and an intermediate horizontal wall extending within said container, a reversible motor vertically mounted within said container and supported below said horizontally extending wall, an "on-off" switch connected to said reversible motor and mounted on an exterior surface of said container, a pinion gear within said container and driven by said reversible motor, a second gear within said container and driven by said pinion gear, a vertically extending threaded shaft extending through said second gear and said horizontal wall and rotatably driven by said second gear and rotatably mounted to the top and bottom of said container and having right hand threads and left hand threads on opposing sides of said second gear and horizontally extending wall, a first and second horizontally extending can-crushing arms, threaded, one to said right hand threads and one to said left hand threads, said arms moving a predetermined distance toward one another from a first position to a second position to effect the crushing of a can placed therebetween, and a reversing switch connected to said reversible motor and extending through said intermediate horizontal wall and actuated by one of said can-crushing arms after moving said predetermined distance to said second position to effect reversal of said motor to thereby move said can-crushing arms from said second position to said first position.

5,067,399

WIRE MARKING APPARATUS FOR MARKING SELECTED CODES ONTO ANY OF A PLURALITY OF WIRES

Stephen R. Berry, Naperville, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Apr. 20, 1990, Ser. No. 511,685

Int. Cl.[5] B41F *17/10*

U.S. Cl. 101—11 **23 Claims**

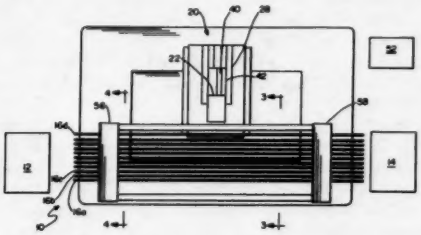
1. A wire marking apparatus for use with a supply of wire and a wire processing means for drawing wire from the supply, said wire marking apparatus including a marking head for marking a selected code onto the wire and an anvil for supporting the wire while marking the code thereon, wherein the improvement comprises:

support means for supporting a plurality of wires to be marked in a parallel array, each wire to be marked being aligned with an anvil means;

longitudinal positioning means for moving the marking

apparatus in a direction extending generally parallel to the wires;

wire selection means for moving at least a portion of the wire marking apparatus in a direction extending generally orthogonal to axes of the wires for positioning a selected



portion of the wire marking apparatus relative to a selected wire to be marked; and

moving means for moving each said wire to be marked relatively toward and into engagement with said marking head to place a selected code thereon.

5,067,400

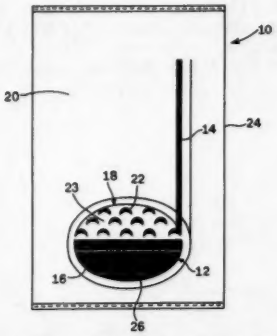
SCREEN PRINTING WITH AN ABRASIVE INK

Gary L. Bezella, and Steven T. Bezella, both of 5124 Island View Dr., Oshkosh, Wis. 54901

Filed Jan. 25, 1990, Ser. No. 470,144

Int. Cl.[5] B41F *15/00*

U.S. Cl. 101—129 **18 Claims**



1. A method of screen printing wherein an ink formulation is pressed through a substantially conventional screen having a plurality of individual strands in woven-like array defining a mesh with openings between the strands, and wherein the screen conventionally has a blocked portion thereof blocking passage of ink through the screen thereat whereby ink may only pass through the multistrand mesh openings at the remaining unblocked portion of the screen,

said method comprising the steps of:

(a) selecting as an ink base an ink having a viscosity of about 2,000 to about 50,000 centipoises at ambient conditions;

(b) combining with said ink base hard abrasive particles having roughened and irregular surfaces including generally sharp edges to form an abrasive ink formulation, said particles having a size to pass through said mesh screen openings;

(c) mixing said ink base and said particles to obtain a substantially uniform dispersion of said particles in said ink base;

(d) pressing said abrasive ink formulation through said screen onto a printable substrate thereby to print said abrasive ink formulation on said substrate; and,

(e) drying said ink formulation on said substrate thereby to provide an abrasive texture thereon.

5,067,401

MOISTENING WATER SUPPLY APPARATUS FOR PRINTING PRESS

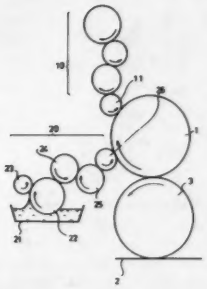
Hiroaki Kusanagi, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433,782

Claims priority, application Japan, Nov. 10, 1988, 63-285211

Int. Cl.[5] B41F *7/26, 7/32*

U.S. Cl. 101—148 **7 Claims**



1. A printing apparatus, comprising:

a printing cylinder;

means for applying ink to said printing cylinder;

water storage means;

a transfer roller having at least a surface portion formed of a rubber material;

means for applying water, including at least one roller, from said water storage means to said transfer roller;

a moistening roller; and

means, including at least one roller, for supplying water from said transfer roller to said moistening roller, a surface of said moistening roller being solely in contact with said printing cylinder and said supply means and separate from said means for applying ink;

said transfer roller supplying water to said moistening roller, said moistening roller supplying water to said printing cylinder, said surface of said transfer roller and said surface of said moistening roller having different hydrophilic properties so as to cause a water contact angle of said transfer roller to be less than a water contact angle of said moistening roller so that the water wetability of said transfer roller is greater than the water wetability of said moistening roller.

5,067,402

APPARATUS FOR THE PREVENTION OF PRINTING MACHINE DAMAGE

Helmut H. Marx, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Nov. 16, 1990, Ser. No. 614,119

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1989, 3938478

Int. Cl.[5] B65H *26/02*

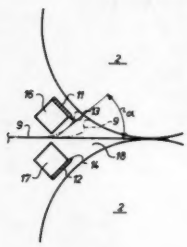
U.S. Cl. 101—226 **3 Claims**

1. A paper web dividing apparatus for the prevention of printing maching damage for a web-fed rotary printing machine having spaced cooperating paper web printing cylinders, said apparatus comprising:

at least a first cross bar positioned adjacent to a peripheral surface of a cylinder of a printing unit which is the last to contact a web passing through a web-fed rotary printing machine, said at least first cross bar being positioned

downstream, in the direction of paper web travel, from said last web contacting cylinder and being generally parallel to an axis of rotation of said last web contacting cylinder;

at least a first paper web dividing knife attached to said at least first cross bar, said at least first paper web dividing knife having a planar surface which is arranged generally parallel to, and spaced at a small distance from, said peripheral surface of said last web contacting cylinder;



a cutting edge on said at least first paper web dividing knife, said cutting edge and said planar surface extending generally upstream, in the direction of web travel, toward said web adjacent said last web contacting cylinder and being positioned to divide the paper web which is wrapped back on said cylinder of the printing unit which is the last to contack said web passing through the printing unit.

5,067,403

CIRCUMFERENTIAL REGISTER ADJUSTMENT SYSTEM FOR A PRINTING MACHINE CYLINDER

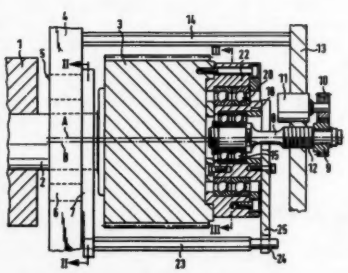
Hartmut Massierer, Neusäss, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed May 24, 1990, Ser. No. 528,584

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921583

Int. Cl.[5] B41F *13/14*

U.S. Cl. 101—248 **7 Claims**



1. In a rotary printing machine having

a printing cylinder (**1**) and a cylinder shaft (**2**), said cylinder and cylinder shaft defining a cylinder axis of rotation (B),

said printing machine having a side wall (**4**), a bearing (**5**) for the shaft (**2**) of the cylinder;

eccentric means (**6, 7**) rotatably retaining said bearing in said side wall for rotation about a bearing axis (A) which is eccentric with respect to said axis of rotation;

an axially movable drive gear (**3**) with inclined or spiral gear teeth thereon, secured to said cylinder shaft;

a threaded rotatable positioning shaft (**8**); and

threaded shaft positioning means (**13**) secured in fixed position with respect to said side wall (**4**) and receiving a thread of said positioning shaft (**8**),

a circumferential register adjustment system for the printing cylinder (**1**),

comprising, in accordance with the invention,

a coupling system for coupling said positioning shaft (**8**) to the drive gear at any selected position of the bearing means (**5**) in said side wall, and regardless of the relative positions of said bearing axis (A) with respect to said cylinder axis (B),

said system including

an eccentric bushing (**18**) located on said positioning shaft (**8**), axially fixed thereon and rotatable with respect thereto;

rotatable means (**20, 22**) for coupling said eccentric bushing to the drive gear (**3**), said rotatable coupling means maintaining an axially fixed predetermined relation between said eccentric bushing (!**8**) and said drive gear (**3**) while permitting relative rotation of said bushing and said drive gear;

connecting link means (**23, 24, 25**) coupling said eccentric means (**6, 7**) and said eccentric bushing (**18**) for conjoint rotation; and

wherein the eccentricities of the eccentric means (**6, 7**) and of the eccentric bushing (**18**) are arranged relative to each other to maintain the position of the axis (A) of the positioning shaft (**8**) invariable with respect to the bearing axis upon rotation of said eccentric means (**5, 6**).

5,067,404

METHOD AND APPARATUS FOR PRINTING BY INKING A LATENT THERMAL IMAGE

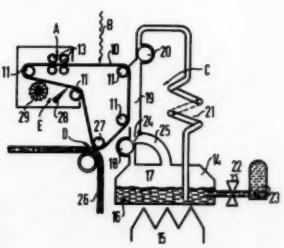
Henning Frunder, Munich, and Manfred Wiedemer, Ismaning, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/DE88/00099, § 371 Date Aug. 21, 1990, § 102(e) Date Aug. 21, 1990, PCT Pub. No. WO89/08286, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 26, 1988, Ser. No. 555,406

Int. Cl.[5] B41L *35/14*

U.S. Cl. 101—488 **9 Claims**



1. A printing process, comprising the following method steps:

a) bringing a medium movably guided in a printer to a uniform temperature;

b) producing a latent thermal character image on the medium with a writing means that is controlled in character-dependent fashion to produce characters when desired; and

c) developing the latent thermal character image to form a developed character image in a development station by one of: condensation of a colored vapor, and separate inking after condensation of a vapor, whereby condensation behavior of the vapor and temperature of the medium are selected such that the vapor precipitates on the medium to define a character to be printed in one of: a positive and negative image; and

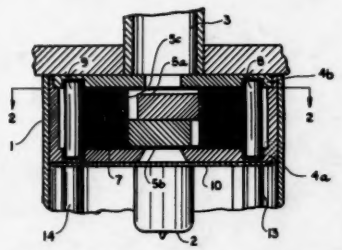
d) transferring the developed character image onto a recording medium in a transfer printing station.

5,067,405

SAFING AND ARMING DEVICE

Dragolyoub Popovitch, 1766 Meadowcrest Dr., Pittsburgh, Pa. 15241, and Herbert L. Andrews, 4256 E. Mercer Ln., Phoeniz, Ariz. 85020

Filed Apr. 12, 1990, Ser. No. 507,992
Int. Cl.[5] F42C *15/23, 15/26, 15/34*
U.S. Cl. 102—232 5 Claims



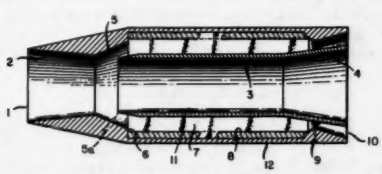
1. In a weapon subject to a sequence of acceleration followed by spin, including a detonator and an explosive charge, the improvement comprising a barrier comprising two superimposed blocks, each having a curved end, which blocks are located between said detonator and explosive charge to normally form an obstruction to prevent accidental detonation of said explosive charge by said detonator, a split cylinder surrounding said blocks, mechanical locking means for normally locking said barrier in place to provide said obstruction, said mechanical locking means responsive to said sequence of acceleration followed by spin in predetermined amounts to remove said barrier and provide an unobstructed path between said detonator and explosive charge.

5,067,406

SUPERSONIC, LOW-DRAG, SOLID FUEL RAMJET TUBULAR PROJECTILE

Donald N. Olson, Lutherville, and Joseph Huerta, Aberdeen, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 5, 1990, Ser. No. 608,915
Int. Cl.[5] F42B *10/34, 15/10*
U.S. Cl. 102—374 4 Claims



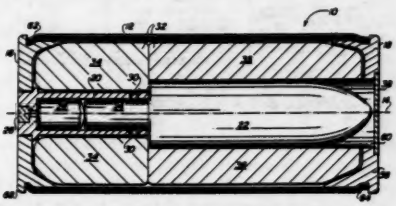
1. A supersonic projectile comprising an essentially tubular body having a forward end and an aft end, including an essentially cylindrical tubular member having a forward constant diameter section and a rearward expansion section which extends to the aft end of the tubular body mounted axially in said tubular body, said tubular member having an axial through bore therein, and open-ended, means for supporting said tubular member within said tubular body such that an annular hollow cylindrical passageway is formed between the tubular member's outside perimeter and the inside surface of said tubular body, said annular passageway, coaxial with said through bore, said tubular body further comprising a first means for diverting portions of air flow passing through said through bore when the projectile is in flight into said annular passageway, such air flow portions in said annular passageway being subsonic when the air flow passing through said through bore is supersonic, and a nozzle means in said tubular body for permitting exit of gas flows from said annular passageway and accelerating said gas flows out the aft end of the said projectile at supersonic speeds, said annular passageway containing a self igniting lining of solid fuel propellant lining an inner wall of the tubular body, whereby said propellant is ignited by the air flow portions in said annular passageway when said projectile is launched at supersonic velocities, such accelerated gas flows exiting the nozzle means providing thrust to said projectile, such thrust augmenting the velocity of the projectile.

5,067,407

CASED TELESCOPED AMMUNITION ROUND

Wilford E. Martwick, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 17, 1990, Ser. No. 524,617
Int. Cl.[5] F42B *5/045*
U.S. Cl. 102—434 4 Claims



3. In a cartridge case for a cased telescoped ammunition round having a hollow cylindrical outer skin having a rear portion, and a front portion, a rear seal, a front seal, and an axis of symmetry; the improvements comprising:

fabricating the outer skin by rolling a thin sheet of spring tempered high carbon steel into a spirally wrapped cylinder having a plurality of layers;

the rear seal and the front seal each having a base and an annular side wall integral with its base, each side wall of the seals having a cylindrical outer surface and an outwardly tapering inner wall terminating in a lip, a crimp groove formed in the outer surface of the side wall of each seal, a wall of the crimp grooves of each seal nearest the lips forming a cam surface; the rear portion of the outer skin being crimped into the crimp groove of the rear seal and the front portion of the outer skin being crimped into the crimp groove of the front seal; only the front and rear portions of the outer skin being annealed prior to being crimped into the crimp grooves of the front and rear seals;

during firing of the round, the circumference of the outer skin increases as the layers of the outer skin unwind, the circumference of the outer skin substantially returning to its initial value prior to being fired when the pressure of the gases produced by the ignited main propellant charge acting on the outer skin returns to ambient pressure after the round is fired; and axial growth of the casing forcing the front and rear portions of the outer skin crimped into the crimp grooves of the front and rear seals to ride up the cam surfaces of said grooves, expanding the diameter of the crimped portions of the outer skin, the stress induced in the expanded crimped portions retracting the end seal when the pressure within the round returns to ambient.

5,067,408

CASED TELESCOPED AMMUNITION ROUND

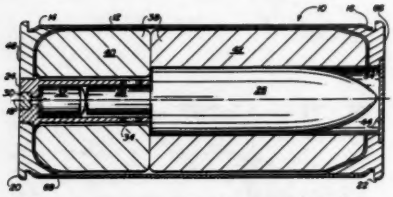
Wilford E. Martwick, Minneapolis, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed May 17, 1990, Ser. No. 524,619
Int. Cl.[5] F42B *5/045*
U.S. Cl. 102—434 4 Claims

3. In a cased telescoped ammunition round having a hollow cylindrical outer skin having a rear portion, and a front portion, a rear seal, a front seal, and an axis of symmetry; the improvements comprising:

fabricating the outer skin from a stainless steel;

the rear seal and the front seal each having a base and an annular side wall integral with its base, each side wall of the seals having a cylindrical outer surface and an outwardly tapering inner wall terminating in a lip, a crimp groove formed in the outer surface of the side wall of each seal, a wall of the crimp grooves of each seal nearest the lips forming a cam surface; the rear portion of the outer skin being crimped into the crimp groove of the rear seal and the front portion of the outer skin being crimped into the crimp groove of the front seal; only the front and rear



portions of the outer skin being annealed prior to being crimped into the crimp grooves of the front and rear seals;

during firing of the round, radial expansion of the outer skin causing elastic deformation of the outer skin, and axial growth of the round forcing the front and rear portions of the outer skin crimped into the crimp grooves of the front and rear seals to ride up the cam surfaces of said grooves, expanding the diameter of the crimped portions of the outer skin, the stress induced in the expanded crimped portions retracting the end seal when the pressure within the round returns to ambient.

5,067,409

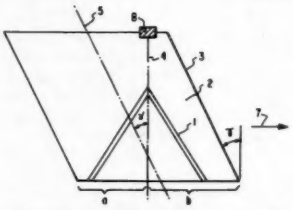
SHAPED CHARGE FOR COMBATING ARMORED TARGETS

Manfred Schildknecht, Friedrichsdorf, and Günter Honcia, Kelkheim-Eppenheim, both of Fed. Rep. of Germany, assignors to Battelle Institut e.V., Frankfurt, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 929,768

Int. Cl.[5] F42B *1/028, 12/10*

U.S. Cl. 102—476 **20 Claims**



1. In a shaped hollow charge disposed in a missle for combatting armored targets and including an explosive charge body having a liner, in the form of a metallic hollow body, extending inwardly from a base end of the charge body, and with said liner having a longitudinal axis extending from said base end and forming an angle between 20° and 160° with the longitudinal axis of the missle; the improvement wherein said explosive charge body has the shape of an oblique cylinder which is inclined with respect to said base end and whose longitudinal axis forms an angle with said longitudinal axis of said liner.

5,067,410

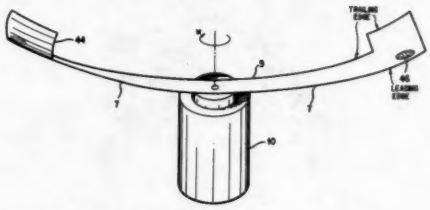
FLEXIBLE WING

James F. Murnane, III, Andover, and William G. Kuhnle, Hopatcong, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1990, Ser. No. 632,211

Int. Cl.[5] F42B *10/48;* **F42C** *15/00*

U.S. Cl. 102—489 **2 Claims**



1. A munition system comprising:

at least one submunition system including;

a flexible fabric wing having two opposing blades for delivering the at least one submunition system in substantially a vertical direction, and for supplying toque, each of said blades having a flap at a trailing outer edge and having a weight at a leading outer edge, said flaps pointed in an opposed direction relative to said wing,

a warhead means for imparting an explosion,

a submunition body for housing said warhead means, an alternator means, located in said submunition body, operatively connected to said flexible wing, and an electronic fuze for electronically arming said at least one submunition system, located in said submunition body, operatively connected between said alternator and said warhead, said alternator and said wing operatively producing electric power for said fuze by rotation of said blades,

whereby each of said blades of said flexible wing forming a swept configuration functionally producing a low drag and a low polar moment of inertia during a first predetermined period of time after launch and during high deployment velocities, and each of said blades of aid wing extend to a near perpendicular orientation relative to a submunition spin axis producing a high polar moment of inertia configuration in shape during a second subsequent predetermined period of time after launch.

2. A munition system of claim 1 having a carrier including a plurality of separate submunition systems.

5,067,411

WEAPON SYSTEMS

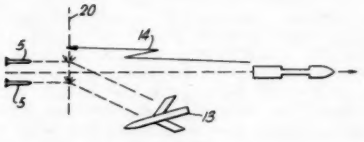
Richard F. Ball, Bristol, United Kingdom, assignor to British Aerospace PLC, London, England

Filed Aug. 6, 1990, Ser. No. 562,955

Claims priority, application United Kingdom, Aug. 10, 1989, 8982679

Int. Cl.[5] F42B *12/58;* **F41G** *7/00*

U.S. Cl. 102—489 **5 Claims**



1. A weapon system for at least damaging a target, said system comprising:

a primary weapon; and

at least one secondary weapon carried by said primary weapon; said primary weapon including:

means for releasing said at least one secondary weapon from said primary weapon;

homing means for guiding said primary weapon towards said target;

sensor means for detecting any target miss-distance; and

transmitter means for transmitting data generated by said sensor means to said at least one secondary weapon; said at least one secondary weapon including:

receiving means for receiving said data transmitted from said primary weapon; and

means for altering course of said at least one secondary weapon relative to said primary weapon in response to said received data in order to damage said target.

5,067,412

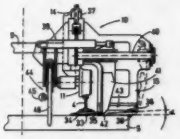
TIE PLATE INSERTING MACHINE

Josef Theurer, Vienna, and Herbert Wörgötter, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 22, 1990, Ser. No. 602,413

Int. Cl.[5] E01B *9/02*

U.S. Cl. 104—16 **12 Claims**



1. A machine for inserting a tie plate between a tie and a rail having a head and a base interconnected by a web, which comprises

(a) a machine frame supported on undercarriages on a railroad track including two of said rails resting on a multiplicity of said ties,

(b) a drive for propelling the machine frame along the track in an operating direction,

(c) an operating unit mounted on the machine frame and comprising (1) a vertically adjustable magazine for storing at least one of said tie plates and (2) a drive for vertically adjusting the magazine,

(d) a tie plate inserting arm for moving a respective one of the tie plates stored in the magazine from the magazine to a position between the tie and the base of the rail, the tie plate inserting arm being transversely displaceable with respect to the machine frame and being connected tot he operating unit,

(e) a drive connected to the tie plate inserting arm for transversely displacing the tie plate inserting arm,, and

(f) a rail lifting device arranged on the machine frame.

5,067,413

APPARATUS FOR CONVEYING TRAVELABLE BODY

Naoyuki Kiuchi, Ibaraki; Masanori Fujimaru, Osaka; Susumu Nakagawa, Amagasaki; Eiji Taguchi, Osaka; Masao Kasagi, Tokyo; Akio Kimura, Yokosuka, and Shinji Kawabe, Yokosuka, all of Japan, assignors to Daifuku Co., Ltd. and Kanto Jidosha Kogyo Kabushiki Kaisha, both of, Japan

Filed Feb. 1, 1990, Ser. No. 474,265

Claims priority, application Japan, Feb. 9, 1989, 1-30494; Feb. 9, 1989, 1-30495; Jul. 10, 1989, 1-178791; Jul. 10, 1989, 1-178792

Int. Cl.[5] B65G *39/00*

U.S. Cl. 104—168 **10 Claims**

1. A device for conveying travelable bodies provided with:

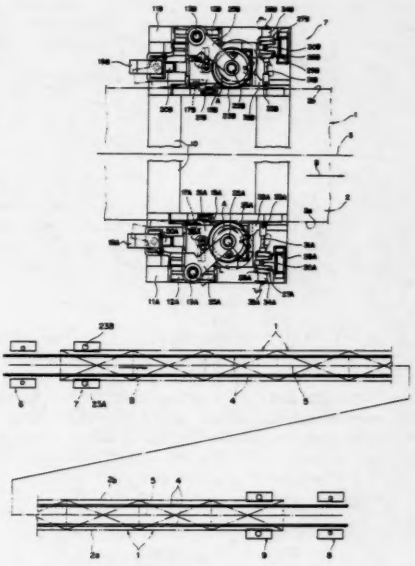
a fixed path allowing a string of travelable bodies to freely travel thereon with a front edge of one travelable body always kept in contact with a rear edge of another travelable body;

means to transmit traveling power to said travelable bodies;

said means to transmit traveling power to said travelable bodies comprising means for subjecting one side of each of said travelable bodies to friction drive and back-up means for subjecting the other side of each of said travelable bodies to pressure at a point opposite said friction drive,

and means for applying braking power to both sides of to said travelable bodies; and

said means to transmit traveling power to said travelable



bodies and said means for applying braking power to said travelable bodies being disposed in a manner such that, when a leading one of said travelable bodies comes to have both its sides pressed laterally by said means for applying braking power to said travelable bodies, a rearmost one of said travelable bodies comes to have both its sides pressed laterally by said means to transmit traveling power to said travelable bodies.

5,067,414

SELF-ADJUSTING SHOCK ABSORBING CARRIER

Archie S. Moore, deceased, late of Kansas City, Mich. by Rosalie I. Moore, personal representative ; Robert J. Teske, Eudora, Kans., and Gareth D. Summa, Riverside, Mich., assignors to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Continuation-in-part of Ser. No. 478,686, Feb. 12, 1990. This application Dec. 13, 1990, Ser. No. 627,184

Int. Cl.[5] B61B *12/04*

U.S. Cl. 104—172.2 **20 Claims**

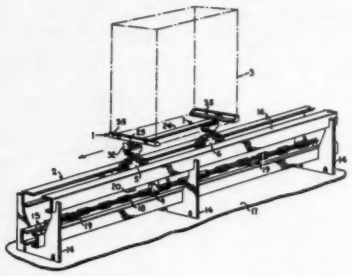
1. A self-adjusting shock absorbing load carrier for a conveyor including means forming a carrier support surface and a carrier drive member engageable with said carrier to propel same along said support surface, said carrier comprising:

(a) an elongated carrier frame member adapted for supporting a load;

(b) a support trolley connected to said frame member and adapted to engage said support surface for movement therealong;

(c) a drive trolley adapted to engage said support surface, to at least partially support said load, and to be drivingly engaged by said drive member to propel said carrier along said support surface; and

(d) friction means movably engaging said drive trolley with said frame member and causing frictional resistance to relative movement therebetween in proportion to a



weight of said load supported by said frame member whereby shock generated by engagement of said drive member with said drive trolley and braking thereof is damped to reduce transmission of said shock to said load.

5,067,415

TRANSPORTING SYSTEM OF FLOATED CARRIER TYPE WITH ZERO POWER CONTROL AT VARYING LOAD WEIGHTS

Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

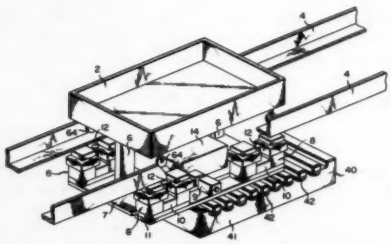
Continuation of Ser. No. 36,175, Apr. 8, 1987, which is a continuation of Ser. No. 726,975, Jun. 25, 1985, abandoned. This application May 25, 1990, Ser. No. 528,752

Claims priority, application Japan, Oct. 23, 1984, 59-222702; Jan. 22, 1985, 60-9774

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] B60L *13/04*

U.S. Cl. 104—281 **12 Claims**



1. A transporting system for transporting cargo to a predetermined position, comprising:

a carrier for carrying cargo;

at least one rail extending along a running path of said carrier and having a bottom section made of a ferromagnetic material;

floating means including a plurality of magnetic units having respective combinations of permanent magnets and electromagnets provided on said carrier such as to face said rail, said carrier being caused to float with respect to said rail by electromagnetic attractive forces acting between said magnets and the bottom section of said rail, each of said magnetic units comprising two faces which are located opposite the bottom section of said rail, each magnetic unit producing a magnetic flux which emerges from one of said faces and extends through a gap to the bottom section of said rail, passes through said bottom section, and returns to the magnetic unit through a gap between the bottom section and the other face;

means for sensing a gap between each said magnetic unit and said rail to generate an output signal;

means for generating an exciting current;

means for energizing said electromagnets by supplying the exciting current thereto according to the output of said sensing means to maintain said carrier in a stable floating condition, the exciting current supplied to said electromagnet being controlled to be substantially zero during a steady state in which all external forces applied to said carrier are overcome and said carrier is maintained in said stable floating condition; and

means coupled to said carrier, for supporting said magnets to allow the gaps between said magnets and said rail to be changed, independently.

5,067,416

PROCESS FOR PRODUCING AN ACID-RESISTANT BARRIER SEAL IN SOIL, AND CONCRETE USABLE FOR THIS PURPOSE

Francis M. L. Delmas, Paris, and Michel A. G. Gandais, Perthes, both of France, assignors to Sondages Injections Furages "S.I.F." Enterprise Bachy, Levallois-Perret, France

Division of Ser. No. 357,954, May 30, 1989, Pat. No. 4,983,075. This application Oct. 17, 1990, Ser. No. 599,119

Claims priority, application France, May 31, 1988, 88 07206

Int. Cl.[5] C04B *12/04*

U.S. Cl. 106—632 **5 Claims**

1. A sealing concrete mixture which will solidify when contacted with acidic water, said concrete mixture comprising water, a clay, an acid-resistant granulate having self-filtering properties, an aqueous solution of a silicate selected from the group consisting of sodium silicate and potassium silicate, said silicate being present in an amount corresponding to 5 to 70 kg of SiO_2 per cubic meter of concrete, said concrete mixture being devoid of any acidic or acid-generating matter liable to form a solid silicic acid gel with the silicate.

5,067,417

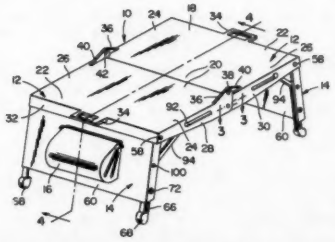
FOLDABLE LIGHT WEIGHT TABLE

Enzo Marmentini, and Joyce Marmentini, both of 1382 Ramona Dr., Newbury, Calif. 91320

Filed Feb. 22, 1990, Ser. No. 482,856

Int. Cl.[5] A47B *3/00*

U.S. Cl. 108—36 **10 Claims**



1. A foldable light weight table including a pair generally horizontal table top half sections including generally co-planar upper surfaces, adjacent and remote margins and opposite side margins extending between said adjacent and remote margins, said remote margins each including downwardly extendible and upwardly retractable leg means, said adjacent margins each, at each of the ends thereof adjacent the corresponding side margins, including a mounting ear disposed generally normal to said adjacent margins and projecting upward above the corresponding upper surface and outwardly beyond the corresponding adjacent margin with the mounting ears of each half section being laterally overlapped relative to the mounting ears of the other half section, and pivot means pivotally interconnecting the overlapped portions of said mounting ears

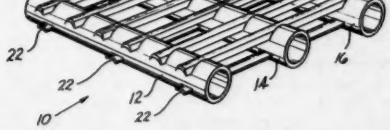
adjacent each pair of corresponding side margins for upward swinging of said remote margins relative to said adjacent margins and movement of said half sections into closely opposing, parallel collapsed positions, said leg means including upper and lower ends and said upper ends being pivotally mounted from said remote margins for upward swinging retraction of the lower ends of said legs toward the corresponding adjacent margins of said table half sections, said table top half sections defining downwardly opening cavities into which said leg means are at least substantially upwardly retractable, said leg means each including upper and lower sections thereof, said lower sections being adjustably extendible and retractable relative to said upper sections, inclined brace means pivotally attached at their lower ends to said upper sections and slidably attached to said side margins for movement therealong at their upper ends, said side margins and upper ends including means operative to releasably anchor said upper ends in positions defining limit positions of movement along said side margins toward said remote margins.

5,067,418

RECYCLABLE PAPERBOARD PALLET

Leewood C. Carter, Riceville, Tenn., assignor to Reusable Rolls, Inc., Riceville, Tenn.

Filed Jul. 24, 1990, Ser. No. 557,184
Int. Cl.[5] B65D *19/12*
U.S. Cl. 108—56.3 **9 Claims**



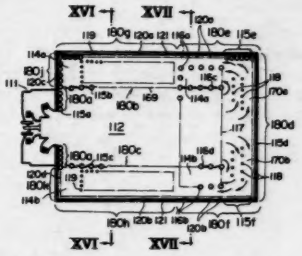
1. A pallet comprising a load supporting deck and a plurality of spaced apart longitudinally elongated runners, said runners being formed from substantially identical cross section thick walled hollow paperboard cylindrical cores having an outside diameter of at least 4 inches and a wall thickness of at least 0.3 inch, each core including a plurality of longitudinally spaced apart substantially identically configured notches extending transversely therethrough and opening outwardly onto a longitudinal top peripheral surface of the respective runner, each of said notches having a pair of longitudinally spaced apart linear side edges, each side edge including at least a portion inclined from said top peripheral surface in diverging manner relative to the other edge of the pair, each of said notches further including a linear edge extending longitudinally and spaced intermediate said top peripheral surface and the axis of the respective cylindrical core runners, said runners being disposed so that the notches of each runner are aligned vertically and longitudinally with corresponding notches in other runners, said deck including a plurality of transversely extending spaced apart deck members, each of said deck members being a longitudinally extending arcuate segment of a thick walled hollow paperboard cylindrical core having an outside diameter of at least 4 inches and a wall thickness of at least 0.3 inch, each segment having a pair of longitudinally extending edges, a convex surface and a concave surface, and each segment being slidably received and positioned within respective aligned notches of the runners with said longitudinally extending edges in tight frictional engagement with portions of said linear side edges, with said concave surface disposed entirely within the respective notches, and with said convex surface disposed in the respective notches and having a central portion in substantially the same plane as the top peripheral surfaces of said runners, whereby said deck members are tightly and securely held within respective notches only by frictional engagement with the side edges of said notches.

5,067,419

LOW NOX BOILER

Hironobu Kobayashi, Katsuta; Shigeru Azuhata, Hitachi; Kiyoshi Narato; Kenichi Sohma, both of Ibaraki; Yasuo Yoshii, Katsuta; Norio Arashi, Hitachi; Shigekazu Nishimoto; Isao Koyama, both of Yokohama; Tooru Inata, Hitachi; Hideo Kikuchi, Hitachi; Tadayoshi Murakami, Hitachi; Masayuki Taniguchi, Katsuta; Hiroshi Miyadera, Hitachi; Fumio Koda, Kure; Tatsuzou Enomoto, Kure, and Kenshi Kobayashi, Kure, all of Japan, assignors to Hitachi, Ltd. and Hitachi Babcock Kabushiki-kaisha, both of Tokyo, Japan

Filed Dec. 26, 1989, Ser. No. 456,561
Claims priority, application Japan, Dec. 26, 1988, 63-325847
Int. Cl.[5] F23M *3/02*; F23C *7/00*; F23D *14/02*; F23R *3/18*
U.S. Cl. 110—234 **7 Claims**



1. A low-NOx boiler comprising:

a furnace;

a burner provided in said furnace for burning gaseous fuel, said burner having nozzle means for injecting a premixture of gaseous fuel and combustion air, and flame holding means located near a downstream side of said nozzle means to interrupt a flow of said premixture to form a circulating flow on a downstream side of said flame holding thereby forming swirls of combustion gas inside and outside of a premixture flame;

heat transfer pipe means for heating water by combustion heat of said burner to generate steam, said heat transfer pipe means being located in said furnace and having a passage through which water flows;

the steam drum means communicating with said heat transfer pipe means and accumulating therein said steam from said heat transfer pipe means;

exhaust gas duct means located in said furnace for exhausting combustion gas generated by combustion of the gaseous fuel outside of said boiler; and

uncombusted gas combusting means located in said exhaust gas duct for combusting an uncombusted content in said combustion gas flowing in said exhaust gas duct means.

5,067,420

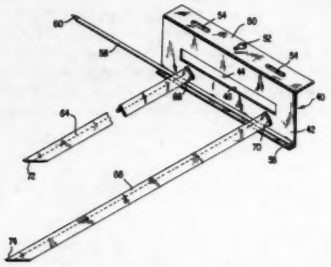
METHOD AND APPARATUS FOR LINING THE INTERIOR SURFACE OF A HIGH TEMPERATURE CHAMBER WITH HEAT INSULATION MATERIAL

James P. Rast, 9510 Herring Hill Rd., Millington, Tenn. 38053

Filed Mar. 20, 1990, Ser. No. 496,004
Int. Cl.[5] F23M *5/00*
U.S. Cl. 110—336 **15 Claims**

1. An insulation lining for the interior surface of a high temperature chamber comprising, a plurality of insulation modules, each of said modules comprising a blanket of heat insulation material which is folded upon itself to form a body means of pleated configuration having opposite sides and lateral sides joining said opposite sides, each module also including a hanger means having a support portion with elongated

prong means extending therefrom, the support portion of said hanger means being disposed adjacent one of said opposite sides of the associated body means, the outer end portions of the prong means of said hanger means extending outwardly beyond the other of the opposite sides of the associated body means, said modules being supported from said interior sur-



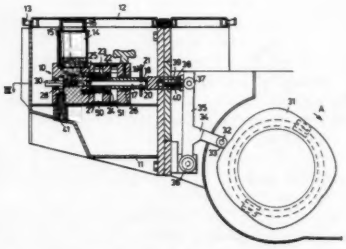
face, pairs of adjacent modules having certain ones of said opposite sides thereof in abutting relationship and the outer end portion of the prong means of one of a pair of adjacent modules directly engaging the support portion of the other one of said pair of adjacent modules to stabilize the adjacent modules and ensure that they are accurately located and maintained in operative position.

5,067,421

SEED-DISPENSING APPARATUS

Morgan Andersson, Lit, Sweden, assignor to Robur Maskin AB, Bracke, Sweden

Filed May 3, 1990, Ser. No. 518,124
Claims priority, application Sweden, May 31, 1989, 8901954
Int. Cl.[5] A01C *7/18*
U.S. Cl. 111—36 **9 Claims**



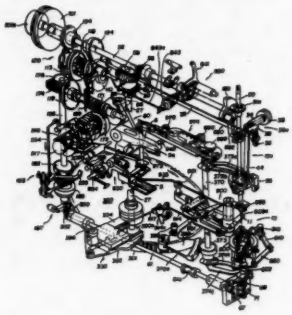
1. An apparatus for sowing seed comprising:
at least one seed-magazine;
at least one seed-dispensing aperture,
at least one seed-carrier provided with means for receiving a fixed number of seeds from said magazine;
a piston-cylinder device having a reciprocable piston connected to said seed carrier;
means for generating a substantially vertical air flow in said seed-dispensing aperture which coacts with said piston, in at least one direction of piston movement; and
force-transmission means operative to move said seed-carrier between a seed receiving position and at least one seed-dispensing position, in which said seed carrier communicates with said seed-dispensing aperture and in which seed-dispensing position the seed carried by said carrier is caused to fall down through said seed-dispensing aperture.

5,067,422

BUTTONHOLE SEWING MACHINE

Kouichi Sakuma, Yamagata, Japan, assignor to Suzuki Manufacturing Co., Ltd., Japan

Division of Ser. No. 84,551, Aug. 12, 1988, Pat. No. 4,903,619, which is a division of Ser. No. 775,088, Sep. 11, 1985, Pat. No. 4,727,817. This application Nov. 2, 1989, Ser. No. 421,551
Claims priority, application Japan, Sep. 14, 1984, 59-194346
Int. Cl.[5] D05B *3/06, 69/00*
U.S. Cl. 112—68 **16 Claims**



7. A buttonhole sewing machine comprising:
an electric motor for driving said sewing machine;
a machine body including a bed for holding a workpiece in cooperation with a work clamping means;
stitch forming means for stitching buttonholes in said work and including a needle bar driving mechanism for driving a needle bar for supporting a needle, a stitch feeding mechanism, a looper-spreader mechanism for driving a looper and a spreader, and a turning mechanism for turning said needle bar, said looper and said spreader, said needle bar driving mechanism being provided with an up/down moving mechanism and a needle vibrating mechanism;
an arm shaft for driving said up/down moving mechanism;
a bed shaft for driving said looper-spreader mechanism;
a cutting mechanism for forming buttonholes in said work;
a rapid feed mechanism for rapidly feeding said bed;
a control cam mechanism for controlling operation of said rapid feed mechanism and said stitch feeding mechanism;
a vertical shaft driven off of said arm shaft for driving said needle vibrating mechanism, said bed shaft, and said stitch feeding mechanism;
a rapid feed drive shaft for driving said rapid feed mechanism and said cutting mechanism;
clutch means for selectively transmitting the torque of said motor (1) to said rapid feed drive shaft for rapid feeding or cutting or (2) to said arm shaft for stitch forming; and
mode change-over means for controlling the respective operations and operational sequences of said cutting mechanism and/or said rapid feed mechanism.

5,067,423

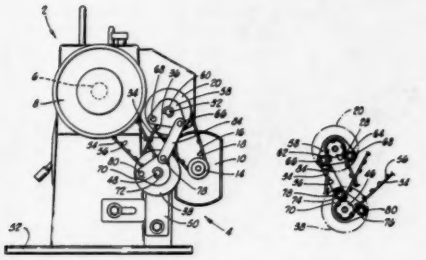
SEWING MACHINE DRIVE ASSEMBLY, INCLUDING PULLEY BELT TRACTION ENHANCEMENT DEVICE

Elmer R. Thompson, 2408 47th St., Lubbock, Tex. 79412

Filed Jun. 6, 1990, Ser. No. 534,049
Int. Cl.[5] D05B *69/12;* **F16H** *7/12*
U.S. Cl. 112—220 **8 Claims**

1. An apparatus for enhancing traction between a pulley belt and a pulley forming part of a sewing machine main crankshaft drive assembly, said apparatus comprising:
a support member having a hole defined therein for receiving a shaft on which the pulley forming part of the sewing machine main crankshaft drive assembly is mounted; and

first and second belt engagement members connected to said support member at respective locations spaced from said hole so that the pulley belt mounted on the pulley is



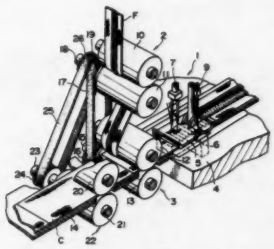
pinched at two locations by said engagement members inwardly generally towards the pulley when said support member is mounted on the shaft on which the pulley is mounted.

5,067,424

APPARATUS FOR SEWING FABRIC PIECES TO SLIDE FASTENER CHAIN

Kiichirou Ishikawa; Chet Dudek, both of Marietta, and James Hutcherson, Kennesaw, all of Ga., assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,750
Int. Cl.[5] D05B *3/12, 23/00*
U.S. Cl. 112—307 **6 Claims**



4. An apparatus for automatically sewing a succession of fabric pieces to a continuous slide fastener chain, the apparatus comprising:

a sewing machine for feeding and sewing the fabric pieces and slide fastener chain together;

guiding means disposed upstream of the sewing machine and including a pair of opposed guide rollers urged towards each other with the slide fastener chain interposed therebetween so as to be driven via the slide fastener chain by the sewing machine while guiding the slide fastener chain towards the sewing machine;

feeding means disposed between the guiding means and the sewing machine and including a pair of opposed feed rollers urged towards each other so as to convergently place therebetween the slide fastener chain into superimposed relation with the fabric pieces and to feed the fabric pieces with the slide fastener chain thus superimposed thereon to the sewing machine;

means for linking one feed roller of the pair of feed rollers of the feeding means and one guide roller of the pair of guide rollers of the guiding means so as to cause said one feed roller and said one guide roller to rotate with each other;

supplying means disposed upstream of the feeding means and including a pair of supply rollers urged towards each other to feed through therebetween the fabric pieces to the feeding means;

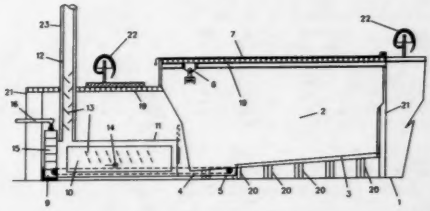
and an additional linking means for linking one supply roller of the pair of supply rollers of the supplying means and an individual guide roller of the pair of guide rollers of the guiding means so as to cause the one supply roller and the individual guide roller to rotate with each other.

5,067,425

REFUSE DISPOSAL DEVICE

Arthur O. Sporleder, 6440 Everhart Rd., #3D, Corpus Christi, Tex. 78413

Filed Feb. 5, 1991, Ser. No. 650,938
Int. Cl.[5] B63B *35/28*
U.S. Cl. 114—26 **6 Claims**



1. Within a self-propelled sea-going vessel comprising means of propulsion, steering, fuel storage, and crew quarters; (1) a common refuse-storage hopper having a bottom mounted within the vessel with an overhead longitudinally-mounted crane, and (2) at least one incinerator mounted within the vessel, said incinerator comprising a shell, an exhaust stack, and baffles therewithin; for each incinerator there shall be: (2a) an ignition and auxiliary fuel feed source mounted through a wall of the incinerator, (2b) a main conveyer mounted longitudinally from below an opening in the bottom of the hopper through the incinerator discharging to an ash pit, (2c) a trough mounted under the opening in the bottom of the hopper, under the main conveyer, and discharging in an ash pit, (2d) an ash pit, and (2e) a lift conveyer from the ash pit to a point above the water line of the vessel.

5,067,426

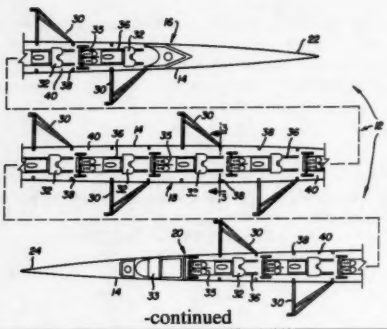
EIGHT MAN ROWING SHELL

Michael Vespoli, 604 West Lake Avenue, Guilford, Conn. 06437; Bruce D. Nelson, 4604 Alhambra St., San Diego, Calif. 92107; Carl Scragg, 1861 Montgomery Ave., Cardiff By The Sea, Calif. 92007, and Paul Fuchs, 32 Ridge St., Greenwich, Conn. 06830

Filed Sep. 1, 1989, Ser. No. 402,074
Int. Cl.[5] B63B *1/00*
U.S. Cl. 114—56 **10 Claims**

1. An eight man rowing shell comprising an elongated hull having a pointed bow and stern and a smoothly tapered hull surface therebetween, said hull surface having a waterline length of 56.625 feet, an entry angle, as measured at the foremost point of the hull along the waterline, of about 4.04 degrees, an exit angle, as measured at the aft-most point of the hull along the waterline, of about 5.25 degrees, and the following cross-section areas, in square feet, below the waterline at stations spaced along the hull waterline when the shell is normally loaded:

station 0	0.000
station 0.5	0.086
station 1	0.224
station 2	0.492
station 3	0.683
station 4	0.816



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station 5	0.868
station 6	0.823
station 7	0.692
station 8	0.492
station 9	0.227
station 9.5	0.079
station 10	0.000

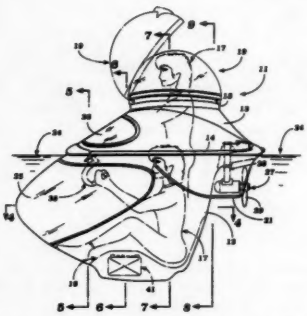
wherein station **0** signifies the fore-most point of the hull, and station **10** signifies the aft-most point of the hull, along the waterline, and wherein a unit station spacing is one-tenth of the waterline length.

5,067,427

SEMI-SUBMERGED WATER VEHICLE

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 6, 1990, Ser. No. 562,715
Claims priority, application Japan, Aug. 9, 1989, 1-207749
Int. Cl.[5] B63B *1/00*
U.S. Cl. 114—56 **16 Claims**



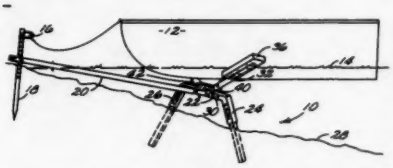
1. A semi-submerged watercraft having a hull defining a rider's compartment for accommodating at least a single rider seated below the water level, the buoyancy of said watercraft being such that a seated rider's eyes are substantially at water level at all times when said watercraft is in a body of water of sufficient depth for said watercraft to float in its semi-submerged condition, a hatch positioned above the water level for entry and exit of the rider, said hull having an underwater porthole through which a rider may view underwater scenes when seated in said rider's compartment, and an above-the-water porthole formed by said hull through which said rider may determine his course when seated in said rider's compartment for operating said watercraft.

5,067,428

PORTABLE BOAT DOCK

Mack F. Dickerson, 948 W. Simmons, Tucson, Ariz. 85705; Curt J. Hendricks, 6990 N. Blue Sky Ter., Tucson, Ariz. 85741, and Gregory A. Hendricks, 5303 E. Cortland Blvd., Apt. J-8, Flagstaff, Ariz. 86004

Filed Sep. 21, 1990, Ser. No. 585,953
Int. Cl.[5] B63B *21/00*
U.S. Cl. 114—230 **14 Claims**



1. A portable boat dock for receiving and securing opposite sides of a boat in a body of water having a shoreline and a bottom, said portable boat dock comprising:

a platform adapted to reside substantially under water, said platform including a central horizontal member, a pair of legs attached to said central horizontal member, a pair of plates also attached to said central horizontal member, and a pair of upwardly protruding arms operably attached to said pair of plates, said pair of legs adapted to reside on the bottom of the body of water and said upwardly protruding arms adapted to reside on opposite sides of the boat being secured;

a tongue attached to said platform to secure said platform in an upright position; and

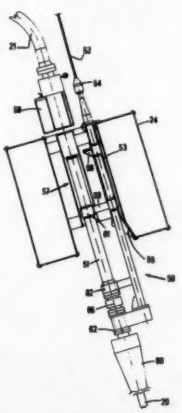
a front holding stake adapted to be secured proximate the shoreline, said stake operably connected to said tongue whereby said platform is secured upright proximate the shoreline.

5,067,429

METHOD FOR MOORING AND CONNECTING AN END OF A FLEXIBLE LINE WITH A CONDUIT OF A FLOATING OFFSHORE EDIFICE

Yvon Castel, Croissy sur Seine, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Sep. 22, 1989, Ser. No. 410,899
Claims priority, application France, Sep. 22, 1988, 88 12405
Int. Cl.[5] F16L *1/00*
U.S. Cl. 114—230 **9 Claims**



1. A method of mooring and connecting at least one flexible line end connected with a bottom base with a conduit of an

edifice disposed at a surface of an aquatic medium, said bottom base being adapted to be utilized for oil effluent production, the method comprising the steps of:

mooring a harpoon attached to a first cable to a float,

pulling the first cable to bring said float toward a support integral with said edifice,

mooring said float to said support,

fixing an arm to an end of said flexible line and attaching the flexible line to a second cable,

at least one of bringing and positioning said flexible line using said second cable to a position for permitting a connection with said conduit,

placing said conduit in a vicinity of said end of said flexible line,

assembling and connecting said conduit and said end of said flexible line together, and

connecting said end of said flexible line to said float.

5,067,430

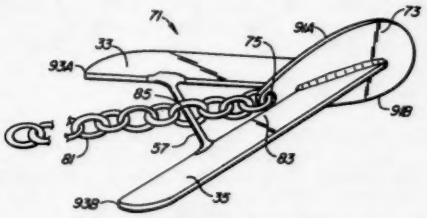
ANCHOR WITH AXIS CONTROL BAR

Charles H. Ford, Oakland, Calif., assignor to The Charles Henry Ford Trust, Created 4/1/88, Oakland, Calif.

Filed Jun. 7, 1990, Ser. No. 534,781

Int. Cl.[5] B63B *21/34*

U.S. Cl. 114—294 **27 Claims**



1. An anchor including no moving parts, comprising:

a first planar member having a first end and a second end formed with a point;

a second planar member having a first end and a second end formed with a point, the first end of said second planar member being joined to said first end of said first planar member such that said first and second planar members are in the shape of a "V";

an axis control bar extending between said first planar member and said second planar member;

a first vane joined to a first side and at said first ends of said first and second planar members in a plane substantially perpendicular to said first and second planar members;

a second vane joined to a second side and at said first ends of said first and second planar members in a plane substantially perpendicular to said first and second planar members; and

a first means for receiving and attaching a chain or rope to said anchor, said first means being spaced from said axis control bar, and said first means being non-moving with respect to said first and second planar members.

5,067,431

VIBRATING ARTICLE COATING AND CONVEYING APPARATUS

Charles E. Heitmiller, Crestwood, Ky., assignor to Carrier Vibrating Equipment, Inc., Louisville, Ky.

Filed Feb. 6, 1990, Ser. No. 475,446

Int. Cl.[5] B65G *27/02*; B05C *11/02*

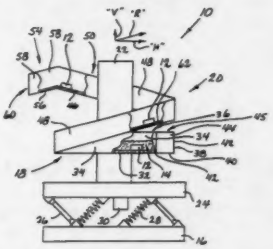
U.S. Cl. 118—57 **4 Claims**

1. A vibrating coating and conveying apparatus for coating articles with a surface coating material and conveying the articles, comprising:

a base;

a reservoir disposed above the base for containing the surface coating material and for receiving the articles to be coated;

a vertically oriented helical conveying flight structure of multiple spiral flights having its bottom end open to the reservoir to receive coated articles from the reservoir through the open bottom end, and for conveying the coated articles generally upwardly out and away from the reservoir to an article discharge at the top end of the flight structure, the spiral flights of the flight structure being all of substantially equal circumferential dimension, the spiral



flights having a floor, side walls and open top, and at least a portion of the floor of at least one of the uppermost spiral flights of the multiple spiral flights being of open reticulated construction for the passage of excess coating material downwardly therethrough and into the next lower spiral flight through the open top of the next lower spiral flight to assure complete coating of the articles being conveyed in the helical structure; and,

means for imparting a cyclical generally torsional motion to the reservoir and vertically oriented helical flight structure.

5,067,432

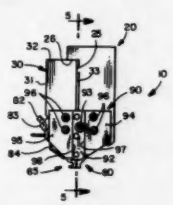
REPLACEABLE WIPING INSERT FOR SLOT DIE HEAD

Harry G. Lippert, Chippewa Falls, Wis., assignor to Extrusion Dies, Inc., Chippewa Falls, Wis.

Filed May 23, 1990, Ser. No. 527,362

Int. Cl.[5] B05C *3/18*

U.S. Cl. 118—413 **16 Claims**



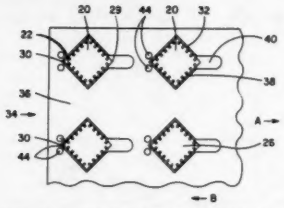
1. In apparatus for applying a coating fluid to a web of material traveling under tension, including a die head having upstream and downstream lips relative to the direction of movement of the web, wherein the lips cooperate to define a slot orifice from which coating fluid may be emitted onto a surface of the web, the improvement comprising: means removably attaching the downstream lip to the die head, means accommodating resilient movement of the downstream lip independently of the upstream lip in directions substantially normal to the surface of the web in response to differential shear levels in the coating fluid.

5,067,433

APPARATUS AND METHOD FOR APPLYING SOLDER TO AN ELECTRICAL COMPONENT

Wilfred A. Doll, Jr, Antwerp, Ohio, and Gregory W. Ison, Fort Wayne, Ind., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 15, 1989, Ser. No. 395,241
Int. Cl.[5] B05C *13/00*
U.S. Cl. 118—500 7 Claims



1. An apparatus for applying a solder material to a leadless chip carrier comprising:

a pallet having a carrying surface which is moved in one direction of movement adjacent to a source of solder material, said carrying surface having a plurality of cavities therein each of which is shaped and adapted to hold a chip carrier inserted therein, each of said cavities having a shape matching that of the respective carrier, and an elongated recess portion extending from a leading edge of the carrier to allow easy insertion and removal of the carrier;

a plurality of chip carriers held in said cavities of said pallet, wherein each chip carrier has a given thickness such that, when it is inserted in the respective cavity of said pallet, a first surface thereof faces toward the source of solder material and projects by a given height above said carrying surface, said first surface being formed in a quadrilateral shape with a diagonal axis thereof arranged in parallel with the direction of movement of said pallet such that said leading edge of the chip carrier is located at one end of the diagonal axis and is a first portion to make contact with the solder material, and an opposed trailing edge of the chip carrier is located at an opposite end of the diagonal axis and is a last portion to make contact with the solder material as the solder material traverses said upper surface by the relative movement of said pallet in said one direction of movement;

each of said chip carriers having a pair of rows of contact pads symmetrically arranged on its first surface on opposite sides of the diagonal axis extending between said leading and trailing edges of the respective carrier, and each of said contact pads having a given solderable surface area and a predetermined spacing from its adjacent contact pads; and

at least one solderable body for each chip carrier positioned on said carrying surface of said pallet spaced from the trailing edge of each respective chip carrier, said solderable body being spaced by a predetermined distance from the last ones of said contact pads in said rows which is substantially equal to the predetermined spacing between adjacent contact pads, and having a solderable surface area at least equal to the solderable surface area of said last contact pads and a height above said carrying surface of said pallet substantially equal to the height of said first surface of the chip carrier above said carrying surface of said pallet,

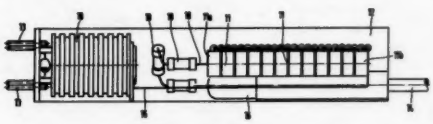
whereby said at least one solderable body conforms in solderable surface area, height, and spacing to said contact pads such that the solder material will break away from the last contact pads at the trailing edge of the respective chip carrier and attach to said solderable body with a uniform surface tension as it attached to the contact pads.

5,067,434

ELECTROSTATIC PAINT SPRAY GUN

Alex Thür, Hinterforst, and Kurt Seitz, Widnau, both of Switzerland, assignors to Wagner International AG, Switzerland

Filed Jun. 21, 1990, Ser. No. 541,514
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921213
Int. Cl.[5] B05B *5/00, 5/02;* H02M *7/10*
U.S. Cl. 118—629 9 Claims



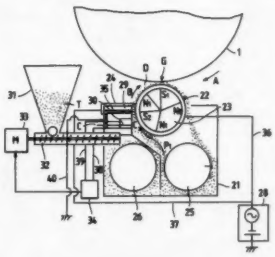
1. An electrostatic paint spray gun comprising a built-in high-voltage generator that is composed of a transformer and a high-voltage cascade extending in the gun barrel, whereby a low-voltage input of the cascade is connected to the transformer output and a high-voltage output is connected to the high-voltage electrode of the gun with a stranded lead, and whereby transformer and cascade are cast into an insulating member, wherein the high-voltage output is conducted out of the insulating member as a stranded electrode lead clad with an insulating hose, a gap is provided between said insulating hose and said insulating member, said gap being filled with an insulating oil and being closed with a sealing member.

5,067,435

TONER DENSITY SENSOR IN CLOSE PROXIMITY TO THE REGULATING BLADE

Akihito Hosaka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 575,680
Claims priority, application Japan, Aug. 31, 1989, 1-225374
Int. Cl.[5] G03G *15/08*
U.S. Cl. 118—653 9 Claims



1. A developing apparatus comprising:

a developer bearing member for bearing developer including toner particles and carrier particles to feed the developer to a developing station;

a regulating member disposed in confronting relation to said developer bearing member and adapted to regulate an amount of the developer fed to said developing station;

a voltage source for outputting an alternating bias voltage, an output of which is applied to said developer bearing member and to said regulating member;

a detecting element disposed in the vicinity of said regulating member and in confronting relation to said developer bearing member and adapted to detect toner density in the developer born by said developer bearing member; and

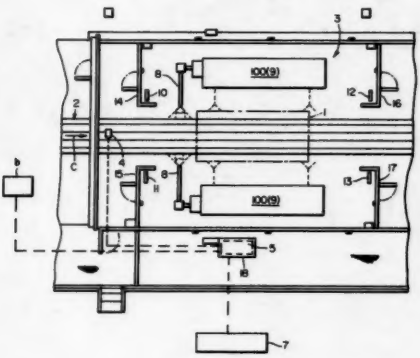
an electrical shield member disposed between said detecting element and said regulating member.

5,067,436

COATING APPARATUS

Eiji Matsushima, and Hidenori Takasaki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 28, 1989, Ser. No. 386,435
Claims priority, application Japan, Jul. 29, 1988, 63-190778
Int. Cl.[5] B06C *11/00*
U.S. Cl. 118—676 9 Claims



2. A coating apparatus for coating paint on articles, comprising:

conveyor means for conveying the articles, in a first direction, successively through a coating station located along the conveyor means;

a spray gun for applying paint on each article as the article moves, in said first direction, through said coating station;

reciprocating means, carrying sad spray gun, provided in the coating station, said reciprocating means and said spray gun moving back and forth in the coating station along the conveyor means in said first direction and in a second direction, opposite to said first direction, the spray gun applying paint to each article substantially throughout movement of said spray gun in said first and second directions;

operating means for moving the reciprocating means and the spray gun in said first and second directions;

conveyor speed detecting means for detecting conveyor speed;

gun speed detecting means for detecting the moving speed of the spray gun in said first direction and the moving speed of the spray gun in said second direction; and

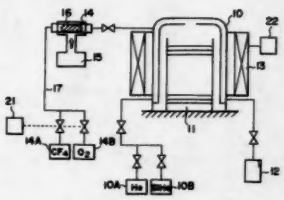
control means for processing input signals from the conveyor speed detecting means and gun speed detecting means and generating an operational signal for the operating means for controlling said moving speed of the spray gun in the first direction and said moving speed of the spray gun in the second direction such that a first relative speed between the article and the spray gun during movement of the spray gun in said first direction and a second relative speed between the article and the spray gun during movement of the spray gun in the second direction are substantially the same as the article moves in said first direction and the spray gun moves in said first and second directions so as to obtain an even coating of paint on each article.

5,067,437

APPARATUS FOR COATING OF SILICON SEMICONDUCTOR SURFACE

Tohru Watanabe, and Katsuya Okumura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1989, Ser. No. 329,847
Claims priority, application Japan, Mar. 28, 1988, 63-73628
Int. Cl.[5] C23C *16/02*
U.S. Cl. 118—715 12 Claims



1. An apparatus for forming a covering film on the silicon surface of an intermediate semiconductor device, comprising:

first means for forming an active species, and

second means for removing an oxide film and forming a covering film;

said first means being a flow ratio regulating means for regulating a flow ratio of gaseous oxygen to a gaseous halogen compound, and discharge means for forming an active species from said gases;

said second means including a casing for housing an intermediate semiconductor device formed of silicon and for introducing said active species, a heating means for heating said intermediate semiconductor device to remove a silicon oxide film formed on said silicon surface of the intermediate semiconductor device by using said active species, temperature regulating means for regulating the temperature of said intermediate semiconductor device, and film forming means for forming a covering film on said silicon surface of said intermediate semiconductor device after said silicon oxide film has been removed therefrom;

said flow ratio regulating means and said temperature regulating means cooperatively regulating said flow ratio and said temperature, respectively, the ratio of the etching speeds of said silicon and said silicon oxide film being 5 or less.

5,067,438

FISH AQUARIUM

Gary Hoffa, 7545 University Ave., La Mesa, Calif. 91941

Filed Jan. 4, 1991, Ser. No. 637,541
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 5 Claims

1. A fish aquarium comprising:

an elongated bottom wall having a front edge, a rear edge, side edges, a depth X and a width Y;

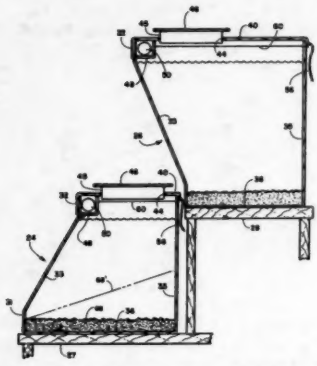
an upright oriented rear wall having a width Y connected to the rear edge of said bottom wall;

an upright oriented transparent front wall having a width Y connected to the front edge of said bottom wall, said front wall having a vertically oriented lower section and a vertically oriented upper section, said lower section being laterally offset a predetermined distance D from said upper section and an angularly oriented central section that connects said upper and lower sections;

a pair of end walls that are connected to the respective side edges of said bottom wall;

a top wall having a bottom surface that is secured to the top edges of said front wall, said rear wall, and said end walls. said top wall having a cutout portion that detachably receives a cover; and

a hermetically sealed elongated light housing that is mounted inside said aquarium adjacent the intersection of said top wall and the upper section of said front wall, said light housing extends across the entire width W of said



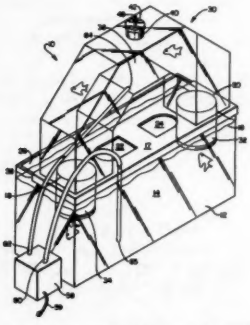
aquarium, an electrical cord in said light housing and waterproofing means for passing the electrical cord through said aquarium from said light housing to the rear wall of said aquarium.

5,067,439

AQUARIUM HYDRO HI-RISE AND CROSSOVER BRIDGE ASSEMBLY

William A. Hand, 3161 Sullivant Ave., Columbus, Ohio 43204

Filed Nov. 2, 1990, Ser. No. 608,361
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 **8 Claims**



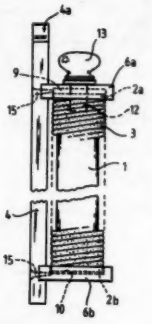
1. An aquarium construction and system including:
a. at least one open top aquarium tank to contain water and aquatic life, such as fish;
b. a cover over the at least one tank with a plurality of apertures in each cover;
c. a crossover bridge for providing a continuous volume of water between separated positions on the surface of the water of said at least one tank, comprising:
i) a walled continuous tube-like hollow structure having opposite ends with a formed intermediate portion therebetween,
ii) first and second water sealing capping means at the ends, operable to close the ends during a filling mode and to open the ends in an operating mode,
iii) said tube-like structure having an aperture in the walls in the intermediate portion, with a third water sealing capping means on the aperture operable to open the aperture during the filling mode and to close the aperture during the operating mode, and
d. means to provide water to the intermediate portion of the crossover bridge during the filling mode.

5,067,440

SCRATCHING POSTS

Allen R. G. Hatten, and Jean Hatten, both of 14 Lindisfarne Avenue, New Waltham, Grimsby, South Humberside, United Kingdom

Filed Dec. 24, 1990, Ser. No. 630,966
Claims priority, application United Kingdom, Dec. 23, 1989, 8929190; Jun. 21, 1990, 9013823
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—29 **7 Claims**



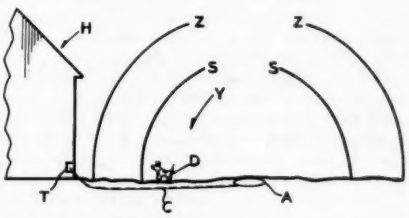
1. A scratching post comprising:
a backing plate;
a pair of spaced support walls projecting from said backing plate;
an elongate carrier member removably mounted between said support walls;
a cheek member secured to each end of said carrier member; and
a flexible element helically close-wound about said carrier member between said cheek members, said flexible element having opposite ends which are releasably secured to said cheek members.

5,067,441

ELECTRONIC ASSEMBLY FOR RESTRICTING ANIMALS TO DEFINED AREAS

Lee D. Weinstein, Houston, Tex., assignor to Torrington Product Ventures, Inc., New Hartford, Conn.

Filed Dec. 10, 1990, Ser. No. 625,313
Int. Cl.[5] A01K *15/02*
U.S. Cl. 119—29 **27 Claims**



1. An animal restraining system comprising:
(a) a radio frequency transmitter for generating radio signals and adapted to be located in or adjacent an area in which an animal is to be restrained;

(b) a transmitting antenna operatively connected to said transmitter for radiating radio frequency signals generated by said transmitter; and

(c) a unit adapted to be worn by the animal, said unit comprising:

(i) a multiplicity of radio signal receivers each having a receiving antenna with said receiving antennae of said multiplicity of receivers having their axes of maximum sensitivity oriented in different directions;

(ii) means for deriving a composite field strength based upon the field strengths of the radio signals received by said receiving antennae;

(iii) means for detecting when the composite field strength detected by said receiving antennae falls below a predetermined value; and

(iv) means in said unit responsive when the composite field strength falls below said predetermined value for generating warning signals to the animal.

5,067,442

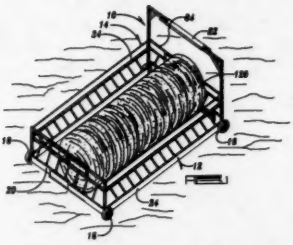
FORAGE FEEDING DEVICE

Harold D. Schilling, R.R. 1, Box 198, Colesburg, Iowa 52035

Filed Mar. 22, 1989, Ser. No. 327,100

Int. Cl.[5] A01K *1/10*

U.S. Cl. 119—60 **21 Claims**



1. A forage feed device, comprising:

first and second frames, each frame including a side frame member with forward and rearward ends, a front frame member having one end connected to the forward end of the side frame member and a distal opposite end, and a rear frame member having one end connected to the rearward end of the side frame member and a distal opposite end, the side frame members having openings therein through which an animal's head is extended for eating feed;

a pair of spaced apart support wheels secured to each frame for rollably supporting the respective frame on a support surface;

a front guide track having opposite sides and having a pair of channels extending toward one another from the opposite sides, said channels having longitudinal axes residing in parallel planes, and said channels slidably receiving the respective distal ends of the front frame members so that the distal ends may slide past one another in the respective channel;

a rear guide track having opposite sides and having a pair of channels extending toward one another from the opposite sides, said channels having longitudinal axes residing in parallel planes, and said channels slidably receiving the respective distal ends of the rear frame members so that the distal ends may slide past one another in the respective channel; and

the first and second frames and the front and rear guide tracks defining an enclosure for containing animal feed, whereby, as the feed is consumed, the animals push against the side frame members so as to roll the first and second frames upon the support wheels towards one another, as guided by the front and rear guide tracks, so as to provide access to additional feed.

5,067,443

MECHANICAL NURSING DEVICE FOR NEONATAL PIGLETS

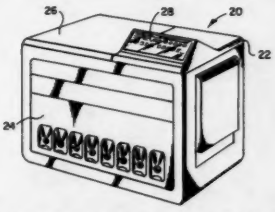
Frank Hurnik, Rockwood; Eric Jarmain, Komoka; Don Phillips; Michael Kirkland, both of London; Douglas Harkes, Thamesford, and Donald J. Gordon, Rockwood, all of Canada, assignors to Farmatic, Inc., Canada

Filed Sep. 28, 1990, Ser. No. 590,235

Claims priority, application Canada, Sep. 29, 1989, 614921

Int. Cl.[5] A01K *9/00*

U.S. Cl. 119—71 **12 Claims**



4. The mechanical nursing apparatus as in claim **1** wherein the nipple bar support for supporting said nipple bar, is pivotally mounted within said housing and pivoted by a reversible direct current electric motor connected thereto by a mechanical linkage which includes a plate affixed to the shaft of the motor and an arm interconnecting the plate and the nipple bar support.

5,067,444

APPARATUS FOR GROOMING ANIMALS

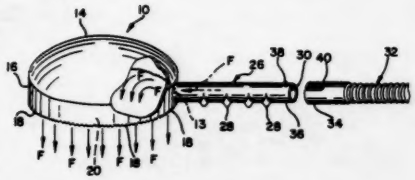
Susan Parker, 7240 Dixon, Forest Park, Ill. 60130

Division of Ser. No. 256,320, Oct. 11, 1988, Pat. No. 4,947,799.

This application May 17, 1990, Ser. No. 525,240

Int. Cl.[5] A01K *13/00*; A45D *20/00, 20/52*

U.S. Cl. 119—85 **8 Claims**



1. A tool for grooming animals comprising:

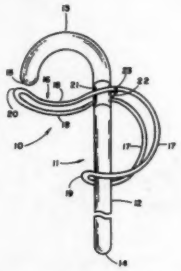
a housing configured as an open-face shell having peripheral wall means extending in a downward direction from a housing top portion to enclose an interior portion forming a forced-air receiving space, said wall means terminating in a plurality of downwardly extending grooming serrations defining the perimeter of housing aperture means, said space being devoid of animal-contacting means other than said serrations to provide an unobstructed space for outward flow of air; and

forced-air receiving connector means communicating with said housing interior space for connection to a source of air under pressure to deliver an air flow into said housing interior space and out of said aperture means.

5,067,445
DEVICE FOR CAPTURING AND RESTRAINING ANIMALS

Donald H. Matthews, 20 Quaker Bottom Rd., Sparks, Md. 21152

Filed Oct. 29, 1990, Ser. No. 604,945
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—152 **7 Claims**



1. A device for capturing and restraining animals, comprised of:

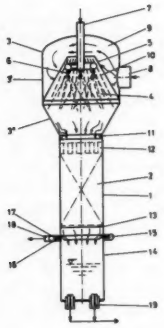
a main body having a handle portion and a crook portion; and

at least one S-shaped member having a restraining loop formed in the one end thereof and a contact loop formed in the other end thereof, the S-shaped member being pivotally secured to and carried by the main body substantially opposite the crook end, such that when an animal's neck is moved into the crook end, the animal's neck contacts the contact loop and pivots the restraining loop into contact with the crook end, thereby closing the crook portion for capturing and restraining the animal therein.

5,067,446
APPARATUS FOR DEGASSING AND HEATING WATER

Francisco Blangetti, Baden; Werner Muri, Baden-Rütihof, and Mustafa Youssef, Zürich, all of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Oct. 17, 1990, Ser. No. 599,039
Claims priority, application Switzerland, Oct. 31, 1989, 3933/89
Int. Cl.[5] F22D *1/30, 1/29, 1/26*; B01D *47/00*
U.S. Cl. 122—441 **4 Claims**



1. An apparatus for degassing and heating water by means of steam, comprising:

an upper housing comprising,

a conical mixing chamber having a conical boundary wall, nozzles coupled to a water supply line by which the water to be degassed is injected within said conical boundary wall,

a steam distribution chamber surrounding said conical mixing chamber and coupled to a steam supply line,

said conical boundary wall of said conical mixing chamber having openings by which steam supplied into said distribution chamber communicates with water to be degassed supplied by said nozzles within said mixing chamber;

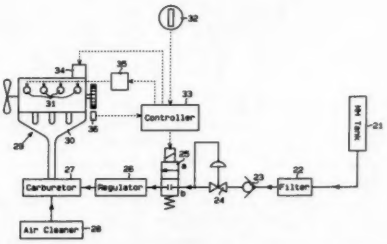
a column with packing bodies arranged therein downstream of said upper housing, said column having a distributor arranged at a head of said column; and

a lower housing communicating with and downstream of said column, including a venting link for exhausting gas/-steam mixture and an output line for passing degassed and heated water.

5,067,447
METHOD FOR CONTROLLING HEAT OF A METAL HYDRIDE CONTAINER

Takashi Iwaki, Okazaki; Kazunori Itou, Ohbu; Hiroshi Matsumoto, Toyota; Kunitoshi Watanabe, Mizumaki; Hiroyuki Suzuki, Kitakyushu; Juzo Shibata, Aichi; Nobuyuki Uematsu, Hoya, and Mamoru Takeda, Chiba, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Nippon Steel Corporation, Tokyo, both of, Japan

Division of Ser. No. 384,302, Jul. 24, 1989. This application Dec. 12, 1990, Ser. No. 628,840
Claims priority, application Japan, Jul. 26, 1988, 63-184535; Sep. 22, 1988, 63-237852; Sep. 22, 1988, 63-237857; Nov. 21, 1988, 63-294172; Nov. 21, 1988, 63-294173
Int. Cl.[5] F02B *43/00*
U.S. Cl. 123—3 **1 Claim**



1. A method for controlling heat of a metal hydride container comprising;

a first step wherein temperature of heat intermedium at a heat intermedium entrance side of the metal hydride container is controlled at a constant value,

a second step wherein an amount of inflow of said heat intermedium, which has been controlled to be at the constant temperature, into said metal hydride container is controlled.

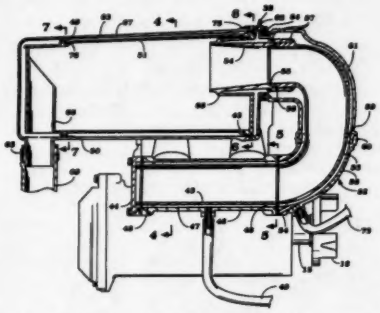
5,067,448
EXHAUST COOLING DEVICE FOR SMALL SIZED BOAT ENGINE

Ryoichi Nakase, and Shigeharu Mineo, both of Hamamatsu, Japan, assignors to Sanshin Industries Co., Ltd., Hamamatsu, Japan

Filed Sep. 26, 1989, Ser. No. 412,850
Claims priority, application Japan, Sep. 27, 1988, 63-241645
Int. Cl.[5] F01P *1/06*
U.S. Cl. 123—41.31 **4 Claims**

1. A cooling arrangement for exhaust pipe or the like of a marine propulsion engine cooled by water drawn by a coolant pump from the body of water in which a watercraft is operated and returned thereto, said exhaust pipe having a horizontally extending portion, a horizontally extending cooling jacket

formed around said horizontally extending portion of said exhaust pipe, a coolant inlet port means connected to said coolant jacket for delivery of water thereto from the body of water by said coolant pump and a coolant outlet port means from said coolant jacket for returning water to the body of water, said coolant outlet port means being sized and positioned relative to said coolant inlet port means to insure the



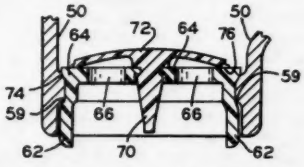
volume of said cooling jacket between said inlet port means and said outlet port means is filled with coolant under all conditions of operation of said coolant pump so as to insure adequate cooling of said exhaust pipe, said coolant outlet port means including a restricted opening at a lower portion of said cooling jacket to drain water from said cooling jacket when the engine is not running but small enough not to deplete the water level in said cooling jacket when said engine is running.

5,067,449

FITTED CRANKCASE BREATHER VALVE ASSEMBLY

Kevin G. Bonde, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Apr. 12, 1991, Ser. No. 684,222
Int. Cl.[5] F01M *13/02*
U.S. Cl. 123—41.86 **12 Claims**



1. In an internal combustion engine including a crankcase having a crankcase interior, a crankcase breather assembly for expulsion of combustion gases from the crankcase interior, comprising:

breather passage means in the crankcase for providing communication of gases out from the crankcase interior, said passage means including an annular recess defining a shoulder having a corner edge; and

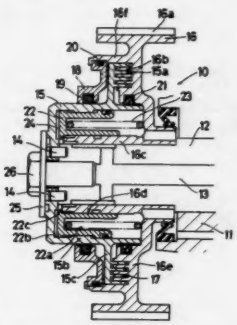
valve means for intermittently permitting the expulsion of gases from the crankcase interior, said valve means including a valve seat portion connected with a flexible breather valve, wherein said valve seat portion includes a locking portion disposed at least partially within said annular recess and forming an interference fit therein, whereby said corner edge positively locks said valve seat within said passage means.

5,067,450

VARIABLE VALVE TIMING SYSTEM HAVING ROTATIONAL VIBRATION DAMPING

Junichi Kano, Kariya; Kongoh Aoki, Toyota; Masahiro Mochizuki, Okazaki, and Hiroyuki Nakadozono, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 9, 1990, Ser. No. 491,208
Claims priority, application Japan, Mar. 14, 1989, 1-61820; Sep. 29, 1989, 1-255718
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 **12 Claims**



1. A variable valve timing system in an engine having a rotating cam-shaft, comprising:

a first timing member driven by the engine;

a second timing member rotatably fixed to the crankshaft;

helical means engaged between said first and second timing members and including a piston movable for adjusting an angular position between said first and second timing members;

hydraulic circuit means for selectively applying a hydraulic pressure to said piston for selectively moving said piston to adjust said angular position; and

damper means on said first and second timing members for hydraulically damping rotational vibrations between said second timing member and said first timing member,

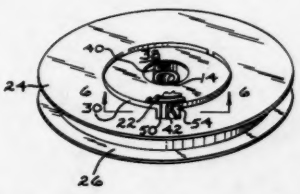
whereby torque variation applied to said second timing member relative so said first timing member do not cause a change in said angular position.

5,067,451

RECOIL SPRING END RETAINER

Rex A. Tyler, Charlotte, Mich., assignor to Eaton Indiana, Inc., Nappanee, Ind.

Filed Aug. 14, 1990, Ser. No. 567,100
Int. Cl.[5] F02N *3/02*
U.S. Cl. 123—185 BA **3 Claims**



1. In a rope pulley for an engine recoil starter wherein the pulley comprises a circular body having an axis, a central hub, a periphery, first and second spaced flanges defining a peripheral rope receiving groove, and a recoil spring receiving recess substantially concentric to the hub radially located intermedi-

ate the hub and the periphery having an axially extending outer wall and an open end adjacent the first flange, the improvement comprising, an elongated axially extending slot defined in the recoil spring receiving recess wall intersecting the recess open end for receiving the bent outer end of a spiral recoil spring located within the spring receiving recess, and a spring retainer abutment defined on the first flange adjacent said slot comprising a web extending from the first flange and a cap plate mounted on said web transversely disposed to the length of said slot, said cap plate adapted to be axially aligned with and overlying a bent spring outer end received within said slot to prevent axial movement of the spring end relative to said slot in the axial direction toward said cap plate and the recess open end.

5,067,452

CYLINDER HEAD AND CYLINDER HEAD COVER FOR INTERNAL COMBUSTION ENGINES

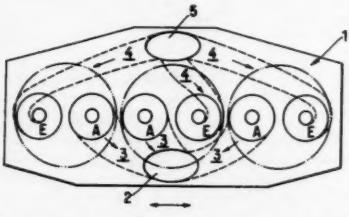
Ludwig Elsbett; Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14-16, D-8543 Hilpoltstein, Fed. Rep. of Germany

Filed Jul. 2, 1990, Ser. No. 547,767

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921662

Int. Cl.[5] F02M *35/00*

U.S. Cl. 123—193 H **10 Claims**



1. An internal combustion engine, particularly a compression-ignition engine, comprising a cylinder block with at least three cylinders; and a cylinder head adjacent said block and having a chamber for each cylinder, a single charge admitting opening, first channels connecting said single opening with said chambers, a single exhaust opening for exhaust gases and second channels connecting said exhaust opening with said chambers.

5,067,453

PISTON OF TWO-CYCLE ENGINE

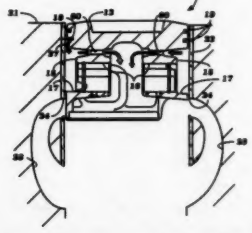
Kazutoshi Takashima, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 7, 1990, Ser. No. 578,934

Claims priority, application Japan, Sep. 7, 1989, 1-232453

Int. Cl.[5] F02F *3/00*

U.S. Cl. 123—193 P **20 Claims**



8. A piston for a two-cycle, crankcase compression engine having scavenge ports said piston having ahead formed with at least one ring groove receiving a piston ring therein, a skirt portion formed below said head and having arcuate portions adapted to face a cylinder bore, a pair of piston pin bosses for receiving a piston pin to connect said piston to a connecting rod, and a blow by passage formed in said piston extending from an area below said piston ring groove for directing blow by gases escaping past said piston ring to an area across said piston pin bosses between said skirt portions to avoid deterioration of lubricant on said skirt portions through the scavenge passage the piston pin bosses.

5,067,454

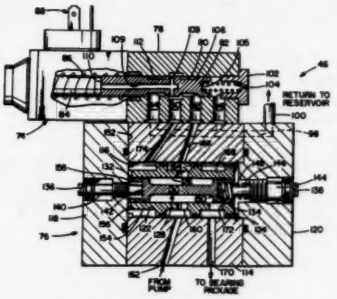
SELF COMPENSATING FLOW CONTROL LUBRICATION SYSTEM

Clive Waddington, Stratford; Normand L. Lagasse, Milford, and Roger Taupier, Orange, all of Conn., assignors to Avco Corporation, Providence, R.I.

Filed Jun. 14, 1989, Ser. No. 366,786

Int. Cl.[5] F01M *1/00*

U.S. Cl. 123—196 S **17 Claims**



1. An automatic self compensating flow control lubrication system for continuously supplying the requisite amount of lubricant to at least one moving component of a drive system comprising:

delivery means for supplying the lubricant from a reservoir to the moving component and for returning the lubricant to the reservoir;

sensor means for detecting an operating parameter being encountered by the drive system and operable to generate signals proportional to deviations from a predetermined value of such operating parameter;

valve means operatively associated with said delivery means for regulating the flow of lubricant to the moving component; and

computer means responsive to the signals from said sensor means for operating said valve means to obtain a predetermined flow of the lubricant to the moving component necessary to return the operating parameter to the predetermined value;

said valve means including:

a first stage solenoid valve responsive to said computer means for regulating the output pressure of lubricant therefrom to a second stage metering valve according to a condition being experienced by said drive system and movable between a first position at which the pressure of the lubricant output is at maximum and a second position at which the pressure of the lubricant output is at minimum; and

a second stage metering valve for receiving pressurized lubricant from said delivery means and for directing flow of the pressurized lubricant to said moving component, said second stage metering valve being movable in response to operation of said first stage solenoid valve, between a minimum flow position allowing minimum flow of the lubricant to the moving component when said first

stage solenoid valve is in said second position and a maximum flow position allowing maximum flow of the lubricant to the moving component when said first stage solenoid valve is in said first position.

5,067,455

METHOD AND APPARATUS FOR ADDING ADDITIVES TO LUBRICATING OIL

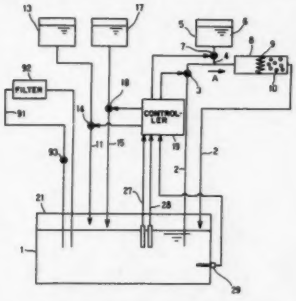
Atsushi Okajima, Kariya; Yasuou Yamazaki; Yasuhide Okamoto, both of Nagoya; Masaei Nozawa, Okazaki; Yukihisa Takeuchi, Chita, and Hajime Akado, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 31, 1990, Ser. No. 605,853

Claims priority, application Japan, Nov. 4, 1989, 1-287739; Oct. 4, 1990, 2-267787

Int. Cl.[5] F01M *9/02*

U.S. Cl. 123—196 R **14 Claims**



1. An apparatus for adding additives to lubricating oil comprising:

detecting means equipped in a circuit of flow of a lubricating oil, for impressing a high voltage between two points in said lubricating oil and measuring a current therebetween, to determine a TBN of said lubricating oil;

supplying means for selectively supplying additives to said lubricating oil; and

controlling means for controlling a supply of said additives by said supplying means when said TBN detected by said detecting means is outside a predetermined range.

5,067,456

HYPOCYCLOID ENGINE

Norman H. Beachley, 2332 Fitchburg Rd., Verona, Wis. 53593, and Frank J. Fronczak, 238 Carillon Dr., Madison, Wis. 53705

Filed Nov. 16, 1990, Ser. No. 614,208

Int. Cl.[5] F02B *75/32*

U.S. Cl. 123—197 AC **13 Claims**

1. A crankshaft assembly a hypocycloid engine, said assembly rotatably supported in an engine crankcase and comprising:

a main output shaft;

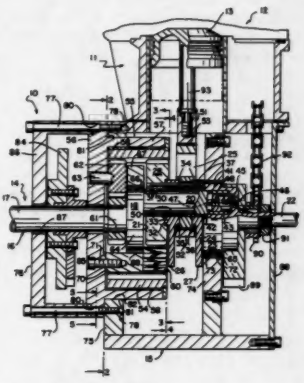
a first cylindrical crank support attached to an inner end of the output shaft coaxially therewith;

a second cylindrical crankpin support attached to an inner end of a stub shaft coaxially therewith;

a cylindrical crankpin extending between and attached by its opposite ends to the first and second crankpin supports, the axis of the crankpin disposed offset from and parallel to a common axis of the output and stub shafts;

a fixedly interconnected subassembly including an eccentric piston rod mounting disc, a pinion gear and counterweight means journalled for rotation on said crankpin, said subassembly including means for interconnecting said mounting disc, pinion gear and counterweight means;

crankpin bearing means rotatably supporting said subassembly on said crankpin, said bearing means positioned to distribute a radial load on said piston rod mounting disc to the ends of the crankpin closely adjacent said crankpin supports; and



first and second support bearings respectively rotatably mounting said first and second crankpin supports in the crankcase directly adjacent the ends of the crankpin.

5,067,457

SWIRL CHAMBER TYPE DIESEL ENGINE

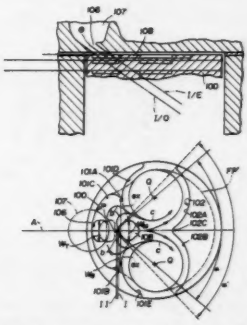
Motohiro Shinzawa, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Apr. 5, 1990, Ser. No. 505,072

Claims priority, application Japan, Apr. 7, 1989, 1-88585

Int. Cl.[5] F02B *19/08*

U.S. Cl. 123—269 **3 Claims**



1. In a swirl chamber type diesel engine, wherein a main combustion chamber is fluidly communicated with a swirl chamber by way of a transfer port, an arrangement comprising:

a piston, having an essentially flat crown portion and an imaginary line of symmetry which divides the circular crown into first and second semi-circular halves, said transfer port being arranged so that an extrapolation thereof falls on said line;

means defining first and second essentially circular dispersion recesses on either side of said line and in said first and second semi-circular halves, said essentially circular dispersion recesses having first and second centers respectively;

means defining an island-like projection, said island-like projection being located on said line;

a V-shaped portion defined on said island-line projection, said V-shaped portion being oriented toward the periph-

ery of the piston, an apex of said V-shaped portion being disposed on said line and arranged so that it is located on the inboard extremum of the extrapolation of the transfer port when the piston assumes a first predetermined position wherein the crank angle is in the range of 17°-21° ATDC and so that it is located on the outboard extremum of the extrapolation when the piston has descended from the first predetermined position to a second predetermined position wherein the crank angle is in the range of 33°-35° ATDC, the inboard and outboard extremums intersecting the crown of the piston at a predetermined angle ϕ, said inboard extremum intersecting the crown of said piston at a point P when the piston assumes its TDC position, said point being located with respect to said first and second essentially circular recesses so that an angle defined between straight lines joining said point P to said first and second centers respectively, does not differ from a predetermined angle by more than $\pm 2°$.

5,067,458

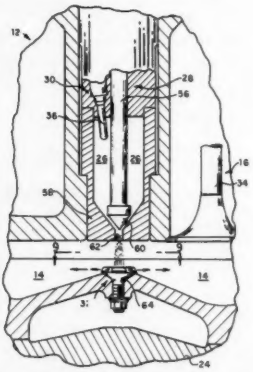
FUEL COMBUSTION SYSTEM AND METHOD OF OPERATION FOR AN OTTO-CYCLE INTERNAL COMBUSTION ENGINE

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 328,976, Mar. 27, 1989, abandoned. This application Nov. 20, 1989, Ser. No. 438,277

Int. Cl.[5] F02B *19/02*

U.S. Cl. 123—292 **23 Claims**



1. A method of combusting a predetermined combustible mixture of fuel and air in an Otto-cycle internal combustion engine including a main combustion chamber, first control valve means for admitting the combustible mixture into the main combustion chamber, an auxiliary combustion chamber, second control valve means for opening and blocking fluid communication between the main combustion chamber and the auxiliary combustion chamber comprising the steps of:

a) admitting the combustible mixture into the main combustion chamber during an intake phase of the cycle;

b) compressing and thereby pressurizing the combustible mixture in the main combustion chamber during a compression phase of the cycle;

c) opening the second control valve means at a predetermined time during a latter portion of the compression phase in order to admit a portion of pressurized combustible mixture into the auxiliary combustion chamber;

d) igniting the portion of combustible mixture admitted to the auxiliary combustion chamber and thereby forming expanding burning gases;

e) directing the expanding burning gases from the auxiliary combustion chamber into the main combustion chamber in order to penetrate and cause ignition and burning of the remaining pressurized combustible mixture in the main combustion chamber; and

f) closing the second control valve means at a predetermined time prior to about the beginning of the next compression phase.

5,067,459

FUEL TIMING CONTROL

Thomas T. Ma, South Woodham Ferrers, England, assignor to Ford Motor Company, Dearborn, Mich.

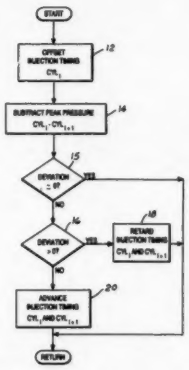
PCT No. PCT/GB89/00504, § 371 Date Oct. 28, 1990, § 102(e) Date Oct. 28, 1990, PCT Pub. No. WO89/11029, PCT Pub. Date Nov. 16, 1989

PCT Filed May 2, 1989, Ser. No. 576,521

Claims priority, application United Kingdom, May 3, 1988, 8810420

Int. Cl.[5] F02B *3/08;* **F02D** *41/04;* **F02M** *51/00*

U.S. Cl. 123—295 **2 Claims**



1. A spark ignited internal combustion engine, in which charge stratification occurs within the combustion chamber and in which the burn quality of the charge is dependent upon the timing of the instant of introduction of the fuel into the charge, comprising:

a sensor provided for each cylinder to produce a signal representative of burn quality in each cylinder;

timing means for controlling the fuel introduction timing in dependence upon the output signal of each sensor so as to optimize the charge stratification within the combustion chamber; and

means for indicating a sense of deviation of the fueling timing from its optimum setting by fueling two of the cylinders of the engine with a given phase difference between them and subtracting the signals from the individual sensors associated with the cylinders from one another to indicate the sense of deviation of the fueling timing from its optimum setting and adjusting the fueling timing in dependence upon the sense of deviation.

5,067,460

VARIABLE AIR/FUEL RATIO ENGINE CONTROL SYSTEM WITH CLOSED-LOOP CONTROL AROUND MAXIMUM EFFICIENCY AND COMBINATION OF OTTO-DIESEL THROTTLING

Edward Van Duyne, Framingham, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 542,445, Jun. 22, 1990, abandoned. This application May 22, 1991, Ser. No. 704,310

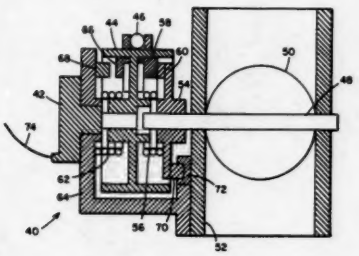
Int. Cl.[5] F02D *9/08*

U.S. Cl. 123—337 **2 Claims**

1. Throttle input device comprising:

a first disk connected to a throttle pedal cable, the first disk arranged to rotate a shaft of a potentiometer;

a second disk arranged to rotate a throttle plate from a closed to a wide open position; and



apparatus to constrain the first and second disks to rotate together until the throttle plate reaches the wide open position, and to allow the first disk alone to continue to rotate thereafter.

5,067,461

METHOD AND APPARATUS FOR METERING FUEL IN A DIESEL ENGINE

Ernst-Ulrich Joachim, Glücksburg, and Hermann Kull, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

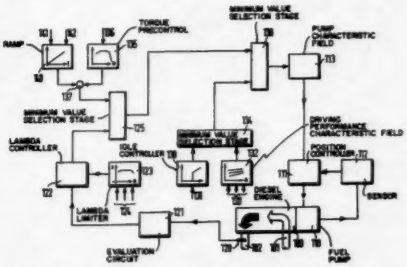
PCT No. PCT/DE88/00467, § 371 Date Mar. 5, 1990, § 102(e) Date Mar. 5, 1990, PCT Pub. No. WO89/02524, PCT Pub. Date Mar. 23, 1989

PCT Filed Jul. 28, 1988, Ser. No. 490,668

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729771

Int. Cl.[5] F02D *31/00*

U.S. Cl. 123—357 **10 Claims**



1. A method of metering fuel to a diesel engine operable at part load and full load, the engine having a controller for supplying a quantity of fuel to the engine via a fuel pump, the method comprising the steps of:

utilizing a lambda probe arranged in the exhaust gas flow of the engine to measure the actual value of lambda which is indicative of the ratio of air and fuel supplied to the engine;

providing a desired value of lambda in dependence upon at least the engine speed;

open-loop controlling the fuel quantity metered to the engine during the part-load operation in dependence upon at least the engine speed and accelerator pedal position;

comparing the desired value of lambda with the actual value of lambda;

transferring from the open-loop control to closed-loop control when the engine passes from part-load operation to full-load operation by utilizing the controller to control the actual value of lambda to the desired value of lambda by controlling the quantity of fuel metered to the engine in dependence upon the comparison of said actual and desired lambda values;

detecting the full-load when the fuel quantity value taken from the characteristic field is greater than the precontrol value dependent upon torque; and,

at full-load, adding a time variable additional signal to the fuel quantity signal dependent upon torque.

5,067,462

CONTROL DEVICE AND METHOD FOR MULTICYLINDER ENGINE WITH A CYLINDER DISCRIMINATION FUNCTION

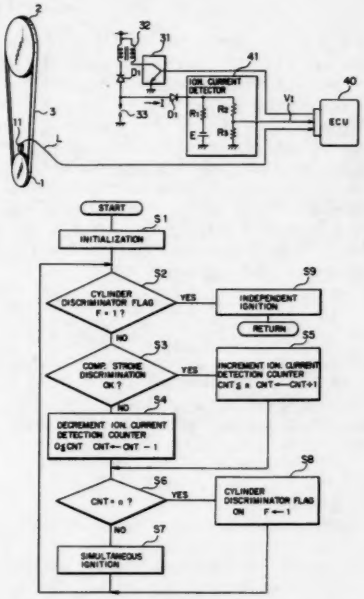
Toshio Iwata, and Toshio Ohsawa, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Oct. 17, 1990, Ser. No. 599,174

Claims priority, application Japan, Oct. 19, 1989, 1-270303

Int. Cl.[5] F02P *5/04*

U.S. Cl. 123—414 **12 Claims**



1. A control method for controlling operational timing of a multi-cylinder internal combustion engine, comprising the steps of:

discriminating a group of cylinders in a compression and an exhaust stroke;

controlling simultaneously operational timing of the group of cylinders discriminated to be in the compression and the exhaust stroke;

discriminating from the group of cylinders in the compression and the exhaust stroke an individual cylinder in the compression stroke by monitoring an internal condition in at least one cylinder in said group of cylinders; and

controlling operational timing of each cylinder of the engine independently after a discrimination of the cylinder in the compression stroke is established.

5,067,463

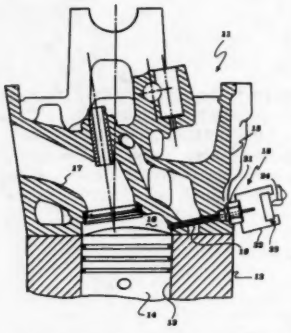
METHOD AND APPARATUS FOR OPERATING AN ENGINE

Donald J. Remboski; Steven L. Plee, both of Northborough; Jialin Yang, Westboro; Robert W. Law, Acton, and Michael T. Vincent, Grafton, all of Mass., assignors to Barrack Technology Limited, West Perth, Australia

Filed Feb. 26, 1990, Ser. No. 485,150

Int. Cl.[5] F02D *41/14*; F02P *5/145*; G01L *23/16*

U.S. Cl. 123—425 27 Claims



1. A method for operating an internal combustion engine having at least one combustion chamber, means for forming a combustible air/fuel mixture within the combustion chamber, means for detecting the luminosity within the combustion chamber during each cycle of operation of the engine from prior to initiation of combustion until after completion of combustion, generating a curve based on the detected luminosity, determining at least the location of minimum luminosity derivative of the luminosity curve in relation to output shaft angle and measuring at least one parameter of the engine based on at least the determined location of minimum luminosity derivative of the luminosity curve.

5,067,464

FUEL INJECTOR FOR AN INTERNAL COMBUSTION ENGINE

David M. Rix; Martin W. Long; Thomas R. Lee, and Douglas E. Dawes, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Mar. 29, 1990, Ser. No. 501,030

Int. Cl.[5] F12M *59/02*

U.S. Cl. 123—446 7 Claims

1. A fuel injector for use in an internal combustion engine comprising:

a fuel injector body having a central axis, a receiving boss and a chamber for receiving a quantity of fuel, said chamber holding said fuel at high pressure during the injection process;

control means for controlling the quantity of said fuel received by said chamber, said control means having a central axis and being mounted to said injector body through said receiving boss;

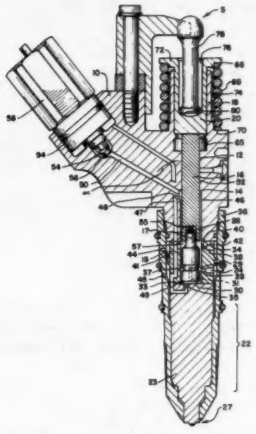
said central axis of said control means intersecting said central axis of said injector body at an acute angle;

a passage formed in said injector body for providing continuous fuel communication between said control means and said chamber, said passage having a central axis;

means for pressurizing said fuel in said chamber;

said passage between said control means and said chamber being exposed to the pressure created in said fuel chamber by said pressurizing means;

said central axis of said passage being positioned substantially coaxially with the central axis of said control means; and,



a nozzle in communication with said chamber for delivering said pressurized fuel into said engine.

5,067,465

LEAN BURN INTERNAL COMBUSTION ENGINE

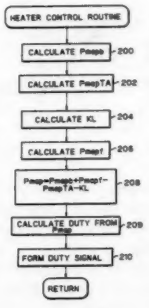
Hirofumi Yamasaki, Kakogawa; Kiyoshi Yagi, Kobe; Keisuke Tsukamoto, Toyota; Toshio Takaoka, Toyota, and Takao Fukuma, Toyota, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 14, 1991, Ser. No. 655,646

Claims priority, application Japan, Feb. 15, 1990, 2-34986; Feb. 15, 1990, 2-34988

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—489 6 Claims



1. A lean burn internal combustion engine, comprising: an engine body;

an intake line for introducing intake air into the engine body;

a throttle valve in said intake line for controlling the amount of air to be introduced into the engine body;

fuel supply means for supplying an amount of fuel into the intake line for producing a lean air-fuel mixture;

an exhaust line for a removal of the resultant exhaust gas from the engine body;

means for detecting an intake pressure in the intake line of the engine;

means for calculating, based on the detected intake pressure, a basic amount of fuel to be supplied to the engine;

means for detecting a degree of opening of the throttle valve;

means for correcting, based on the detected degree of opening of the throttle valve, the basic fuel amount needed to obtain a lean air-fuel mixture;

means for operating the fuel supply means so that the corrected amount of fuel is supplied into the engine body;

sensor means arranged in the exhaust system for detecting an air-fuel ratio, said sensor means having a sensing element in contact with the exhaust gas and a heater means for obtaining an activated temperature of the sensing element;

feedback means for carrying out a feedback control of the air-fuel ratio when necessary, so that the detected air-fuel ratio corresponds to the desired air-fuel ratio;

means, based on the detected intake pressure, for controlling the electric power in the heater means, and;

means, based on the degree of opening of throttle valve, for reducing an electric power in the heater from that obtained in accordance with the intake pressure, to thereby prevent an overheating of the sensor element.

5,067,466

SYSTEM FOR MEASURING AIR FLOW RATE FOR INTERNAL COMBUSTION ENGINES

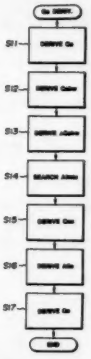
Hatsuo Nagaishi, Kanawaga, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jan. 23, 1991, Ser. No. 644,373

Claims priority, application Japan, Jan. 25, 1990, 2-15784

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—494 **4 Claims**



1. A system for measuring a flow rate of air passing through an air passage, said system comprising:

a hot-wire type air flow meter for monitoring a flow rate of air passing through an air passage to produce a sensor signal representative of the air flow rate, said air flow meter including a sensor portion which has a ceramic member and a heating element wound onto the ceramic member, and a control circuit for controlling current supplied to the heating element so as to hold temperature of the heating element constant;

first means for receiving said sensor signal of the air flow meter to derive a variation of said sensor signal value per a first predetermined period of time to produce a first signal representative of the variation of the sensor signal value;

second means for receiving said first signal to integrate said first signal value over a second predetermined period of time to attenuate the integrated value of the first signal value at a predetermined speed to produce a second signal representative of the attenuated value; and

third means for receiving said sensor signal and said second signal to correct said sensor signal value of the air flow meter on the basis of the attenuated value to derive a corrected flow rate of air.

5,067,467

INTENSIFIER-INJECTOR FOR GASEOUS FUEL FOR POSITIVE DISPLACEMENT ENGINES

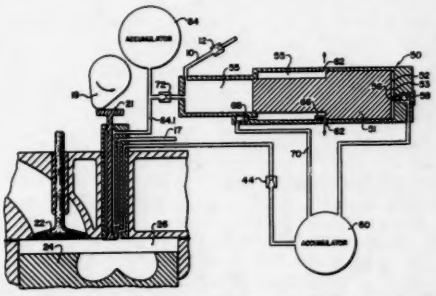
Philip G. Hill; Ronald J. Pierik, both of Vancouver, and K. Bruce Hodgins, Delta, all of Canada, assignors to The University of British Columbia, Vancouver, Canada

Filed Nov. 27, 1989, Ser. No. 441,104

Claims priority, application Canada, Nov. 29, 1988, 584496

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—497 **48 Claims**



1. An intensifier-injector for gaseous fuels in internal combustion engines comprising means which utilizes the compressed gas from the chamber of the internal combustion engine or another source of high pressure gas or fluid to drive an intensifier means which raises the pressure of fuel gas to a constant pressure sufficient for rapid injection into the cylinder of the internal combustion engine regardless of the fuel gas storage pressure or engine demand for fuel.

5,067,468

APPARATUS FOR PREVENTING DISCHARGE OF FUEL VAPOR

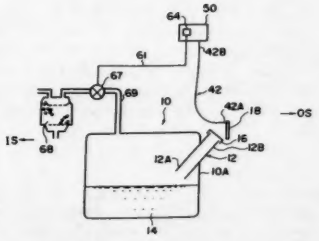
Hidekazu Otowa; Kazuhiro Okada; Hidefumi Sonoda, and Tadao Kaneko, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 2, 1990, Ser. No. 502,278

Claims priority, application Japan, Apr. 3, 1989, 1-39362[U]

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—516 **13 Claims**



1. An apparatus for preventing discharge of fuel vapor, comprising:

a fuel tank;

adsorbing means for adsorbing fuel vapor;

communicating means for communication between said adsorbing means and said fuel tank;

control means for opening a fuel lid through remote control, said control means including mounting means having a base plate for mounting said control means in a vehicle

compartment remote from said fuel tank, said control means having a lever with a handle portion pivotably mounted on said mounting means;

switching means secured to said control means responsive to the operation of said control means for opening said fuel lid;

actuating means disposed on one of said lever and said mounting means for actuating said switching means upon operation of the handle portion of said lever; and

valve means for closing said communicating means upon the closing of said fuel lid and for opening said communicating means in interlocking relation with the operation of said switching means.

5,067,469

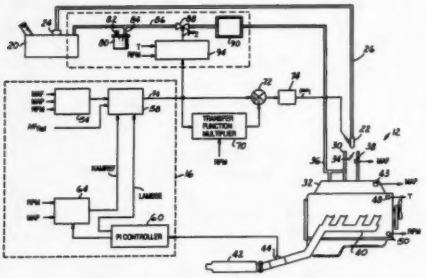
FUEL VAPOR RECOVERY SYSTEM AND METHOD

Douglas R. Hamburg, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 405,153, Sep. 11, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 725,931

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—520 **12 Claims**



1. A control system for an internal combustion engine, comprising:

measurement means for providing a measurement of mass airflow inducted into an air/fuel intake of the engine;

an exhaust gas oxygen sensor coupled to an engine exhaust;

air/fuel control means for providing a desired fuel charge signal related to said measurement of airflow, said air/fuel control means also being responsive to said exhaust gas oxygen sensor and a desired air/fuel ratio reference;

a fuel system including at least one electronically actuated fuel injector coupled to a fuel tank through a fuel line and fuel pump, said fuel injector delivering fuel to said air/fuel intake in proportion to said desired fuel charge signals;

a vapor recovery system including a vapor storage canister and purge line for coupling fuel vapors from both said fuel tank and said canister to said air/fuel intake via a solenoid;

vapor flow means for regulating flow rate of said vapors into said air/fuel intake in proportion to said desired fuel charge signal by electronically modulating said solenoid valve with a modulation signal having a pulse width proportional to said desired fuel charge signal; and

correction means for adding a correction factor to said desired fuel charge signal, said correction factor approximating response time of a change in said vapor flow rate in relation to a change in said air flow measurement.

5,067,470

EXHAUST-GAS RECYCLING DEVICE FOR AN INTERNAL-COMBUSTION ENGINE

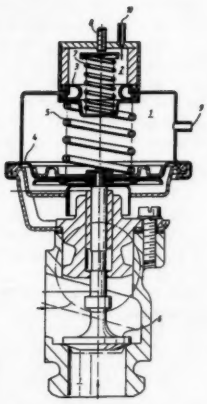
Detlef Panten, Korb; Dirk Naber, Stuttgart, and Franz Bender, Wendlingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 18, 1990, Ser. No. 599,443

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1989, 3935093

Int. Cl.[5] F02B *47/08;* **F02D** *21/08;* **F02M** *25/07*

U.S. Cl. 123—568 **2 Claims**



1. Device for controlling the exhaust-gas recycling quantity on an internal-combustion engine, with an exhaust-gas recycling line branched off from an exhaust-gas line to an inlet line and with an exhaust-gas recycling valve arranged in the exhaust-gas recycling line and comprising a valve controlling the connection between the inlet and outlet lines and a pneumatic control drive consisting of two diaphragms which are clamped in a housing and which are connected operatively to a closing part of the valve, at least one diaphragm being connected firmly to the closing part, and the two diaphragms each being loaded by a spring in the closing direction of the closing part, the diaphragms subdividing the housing into at least two control chambers, of which a first control chamber located between the diaphragms can be subjected to a control pressure determined as a function of the engine running and a second control chamber formed by the second diaphragm and the housing can be subjected to a further control pressure, wherein the second control chamber is subjected as a control pressure to the exhaust-gas pressure from the exhaust-gas line.

5,067,471

PORTABLE CATAPULT DEVICE FOR HURLING A SUCCESSION OF BALLS FOR BATTING PRACTICE

John Y. Kim, 144 S. Whisman Rd., Mt. View, Calif. 94041

Continuation-in-part of Ser. No. 247,713, Sep. 22, 1988, abandoned. This application Apr. 20, 1990, Ser. No. 511,632

Int. Cl.[5] F41B *3/02*

U.S. Cl. 124—21 **18 Claims**

1. A portable catapult device for automatically hurling along a central axis a succession of balls individually so that each ball after it leaves the catapult presents a moving target for batting practice, comprising:

a base member having a central axis along which a ball is adapted to be propelled;

a hopper associated with said base member for containing a multiplicity of balls to be automatically fed in succession onto said base member along said central axis to be hurled individually from the device;

a carriage mounted on said base member for controlled

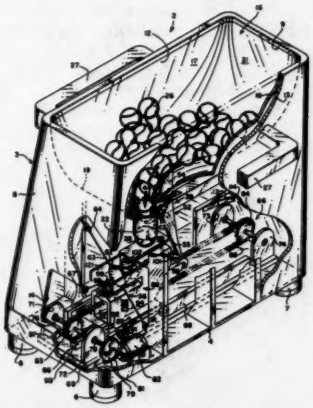
uniform velocity reciprocal movement alternately between first and second positions and between said second and first positions along said central axis;

means on said base member operable to effect said controlled uniform velocity reciprocal movement of said carriage initially between said first and second positions and thereafter between said second and first positions;

a sling elastically mounted on the base member and a ball-propelling member elastically supported on said base member for movement along said central axis;

at least three elastic bands supporting said ball-propelling member, inner converging ends of each of said at least three elastic bands being connected to said ball-propelling member, and opposite ends of each of said at least three elastic bands being anchored to said base member at attachment points which are symmetrical with respect to said central axis and which lie in a common plane;

means for releasably engaging said ball-propelling member with said carriage when said carriage is in said first position and for releasing said ball-propelling member from



said carriage when said carriage is in said second position, said ball-propelling member when released from said carriage moving toward said first position apart from said carriage; and

means on said base member operable in concert with movement of said carriage toward said second position for transferring a ball from said hopper to a position coincident with said central axis to interact with said ball-propelling member apart from said carriage when said ball-propelling member is released from said carriage at said second position, the attachment of said opposite ends of said at least three elastic bands at said symmetrical attachment points causing said ball-propelling member to travel a straight path coincident with said central axis of said base member, said ball being hurled along said central axis and from the device through a predetermined trajectory by elastic return of said ball-propelling member from said second position toward and beyond said first position, said ball-propelling member being elastically returned to said first position after separation from said ball beyond said first position.

5,067,472

BOW STRING RELEASE

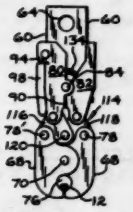
Michael A. Vogel, 7875 Hollywood Dr., and Martin D. Sears, 3901 Harwich, both of Jackson, Mich. 49203

Filed Jul. 26, 1990, Ser. No. 558,227

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—35.2 **13 Claims**

1. A bow string release comprising, in combination, an elongated body having a first end, a second end, a central region intermediate said ends, opposite lateral edges and opposite sides, a pair of bow string retainers movably mounted on said body between string retaining and string releasing positions, a pair of retainer operators movably mounted upon said body each having a manually engageable handle portion defined thereon and movable between first and second positions, said



handle portions each extending from a body lateral edge, and linkage means interposed between said retainers and said retainer operators whereby manually moving said retainer operators handle portions toward each other from said first position to said second position moves said bow string retainers from said string retaining position to said string releasing position.

5,067,473

HEATER WITH A HUMIDIFIER

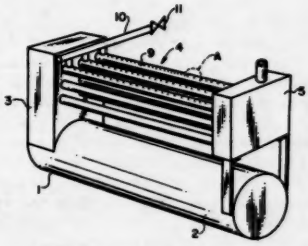
Tae S. Oh, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 18, 1990, Ser. No. 553,803

Claims priority, application Rep. of Korea, Jul. 19, 1989, 10486/89[U]

Int. Cl.[5] F24F *3/14*; F24H *3/00*

U.S. Cl. 126—113 **3 Claims**



1. A combined forced convection-type heater and humidifier, comprising:

an elongated burner having two opposite ends;

a burner gas distribution chamber disposed at one end of said burner, in communication with said burner for receiving hot burner gas from said burner;

an exhaust gas collection tank disposed at an opposite end of said burner;

a plurality of double-walled pipes disposed parallel to one another and mounted so as to extend generally horizontally between said burner gas distribution chamber and said exhaust gas collection tank; each said double-walled pipe comprising an inner wall enclosing a first space, and an outer wall, spaced from, but coaxial with, the respective said inner wall and enclosing a second, annular space; each said first space communicating between said burner gas distribution chamber and said exhaust gas collection chamber, so that, in use, hot combustion gas may flow from said burner gas distribution chamber to said exhaust gas collection chamber through said first spaces of said double-walled pipes for thereby indirectly heating air forced externally across said double-walled pipes; said second spaces being closed off from communication with

said burner gas distribution chamber and said exhaust gas collection chamber;

means defining a plurality of steam outlet openings through each said outer wall in an upper portion of each said outer wall; and

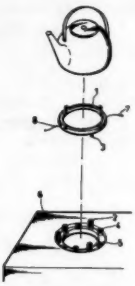
means for introducing a supply of water into said second spaces, so that as hot combustion gas flows through said first spaces, said inner walls become heated, causing the water to boil in said second spaces, and to spurt through said steam outlet openings into the air which is being indirectly heated while being forced to flow externally across said double-walled pipes.

5,067,474

BOILING DETECTING DEVICES FOR A STOVE

Lei L. Chi, Fl. 2, No. 13, Lane 534, Wan Ta Road, Taipei, Taiwan

Filed Sep. 28, 1990, Ser. No. 589,266
Int. Cl.[5] A47J *27/62*
U.S. Cl. 126—374 **2 Claims**



1. A boiling detector for a stove comprising:

a vibration detecting support resiliently coupled to a stove for supporting a vessel containing a liquid to be heated, said resilient coupling being defined by a plurality of sets of spring members disposed between said vibration detecting support and said stove, each of said sets of spring members being defined by a different length dimension and elasticity coefficient, each with respect to the others;

a sensor coupled to said vibration detecting support for establishing an output pulse signal responsive to vibration produced by boiling of said liquid in said vessel;

a frequency to voltage converter coupled to said sensor for generating a voltage proportional to a frequency of said output pulse signal;

a voltage detector coupled to said frequency to voltage converter for generating an output voltage signal responsive to said proportional voltage having a magnitude above a predetermined value;

a driving stage coupled to said voltage detector for actuating a switching device responsive to said output voltage signal of said voltage detector; and

safety means coupled to said driving stage for interrupting energy supplied to said stove.

5,067,475

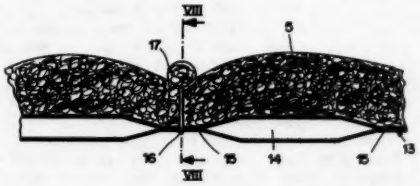
RADIATION SHIELD

Mario Posnansky, Bern, Switzerland, assignor to Atlantis Energie AG, Bern, Switzerland

Filed Aug. 1, 1990, Ser. No. 561,326
Claims priority, application Switzerland, Aug. 11, 1989, 2949/89
Int. Cl.[5] F24J *3/02*
U.S. Cl. 126—418 **8 Claims**

1. A device for protecting the surfaces of the objects from the effects of radiation, especially from the effects of concentrated solar radiation, which comprises:

means for covering the surface to be protected, wherein the means for covering the surface comprises a plurality of



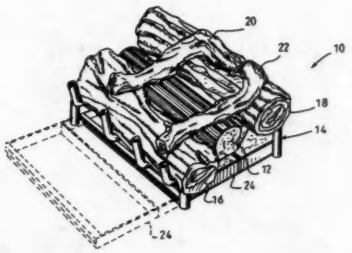
quartz glass bodies for being exposed to the radiation and being disposed in series for stepwise reflection of the radiation wherein said quartz glass bodies comprise quartz glass fibers interlaced to form a batting.

5,067,476

ARTIFICIAL LOG ASSEMBLY INCLUDING COMBUSTABLE LOG MEMBERS

Robert T. Rhodes, Jr., Peru, Ind., assignor to Majco Building Specialties, L.P., Huntington, Ind.

Filed Aug. 2, 1990, Ser. No. 561,874
Int. Cl.[5] F23H *13/00*
U.S. Cl. 126—540 **20 Claims**



1. An assembly for providing a natural looking fire within a fireplace or the like, comprising:

a grate;

first and second non-combustible log members supported by said grate and extending transversely with respect to said grate, and

a combustible log member positioned between and adjoining said first and second non-combustible log members, said combustible log member extending transversely with respect to said grate.

5,067,477

LOW WEAR BEARING FOR A SURGICAL RETRACTOR

John Santangelo, East Freetown, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Aug. 1, 1989, Ser. No. 388,109
Int. Cl.[5] A61B *17/02*
U.S. Cl. 128—20 **7 Claims**

1. In a rack and pinion type retractor having:

a rack having teeth to accept and cooperate with a pinion;

a pinion;

a first arm attached to and extending to one side of said rack;

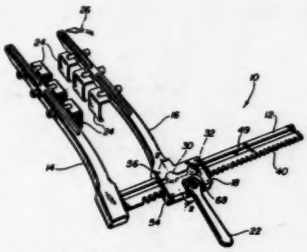
a second arm extending to the same side of said rack; housing means connected to said second arm for receiving said rack and supporting said pinion;

said rack and pinion operating to separate said arms and retract tissue:

the improvement comprising:

means operatively connected to said rack and said housing means to limit the rotation of said housing means with respect to said rack when said arms are moved apart to retract tissue to reduce the resulting contact stresses between the rack and the housing means including:

at least two force distributing means mounted on said housing means and including at least three bearings each having a generally cylindrical base and a generally rectangular portion projecting from said base;



with two of said bearings disposed on one side of said rack with one of said bearings disposed on the opposite side of said rack;

said housing means having generally cylindrical recessess therein to receive, in loose fitting rotatable relationship, each of said bearings respectively with the bearings on the same side of said rack spaced longitudinally along said rack;

said rack having a slot on opposed sides thereof aligned with said recesses to receive said rectangular portions from the bearings.

5,067,478

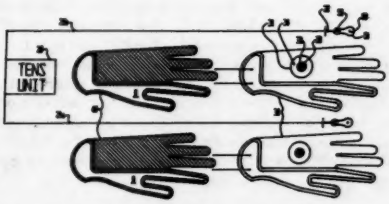
STRUCTURE AND METHOD OF MANUFACTURING AN ELECTRODE GLOVE FOR APPLYING ELECTRO-MASSAGE AND ELECTRO-ACUPRESSURE TO PATIENTS

Stephen R. Berlant, 392 Marple Rd., Broomall, Pa. 19008

Continuation-in-part of Ser. No. 209,432, Jun. 21, 1988. This application Dec. 18, 1989, Ser. No. 451,764

Int. Cl.[5] A61H *1/00*

U.S. Cl. 128—24.5 **14 Claims**



1. Apparatus for applying electro-massage and electro-acupressure for use with a sauce of pulsed electrical energy such as a TENS unit, said apparatus comprising:

a glove covering substantially al of the fingers, palm and dorsal surfaces of a hand, said glove being formed of a flexible, electrically-insulating layer of material capable of insulating the hand against pulsed, direct currents at voltages of up to 500 volts;

an electrode affixed to an covering substantially all of the exterior surface of said glove, said electrode being formed of a non-metallic, flexible, electrically-conductive layer of material deposited as a coating.

5,067,479

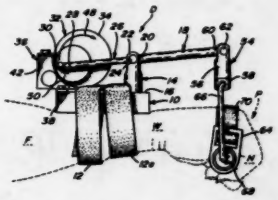
CONTINUOUS PASSIVE MOTION DEVICE

John Saringer, Markham, and Andrew Galbreath, Toronto, both of Canada, assignors to Toronto Medical Corp., Pickering, Canada

Filed Aug. 21, 1990, Ser. No. 570,550

Int. Cl.[5] A61H *1/02*

U.S. Cl. 128—26 **20 Claims**



12. A device for providing continuous passive motion therapy to a joint of a patient's body comprising a base, attachment means for removably attaching said base to a first member of the body located on one side of the joint for allowing a pivot thereof, an upstanding wheel means mounted on said base and adapted to be relatively oriented and secured thereon for rotation in various planes which at least include one plane which is oblique to a general longitudinal axis of the first member, motor means driving said wheel means, and an elongated motion transmission means joining said wheel means and a second member of the body located on the other side of the joint, said transmission means being mounted eccentrically to said wheel means, said wheel means and said transmission means being adapted to impart upon actuation of said motor means various pivoting motions to the joint which depend on the selected rotation plane of said wheel means relative to said base and which include, for said one plane, an ellipse-shaped motion.

5,067,480

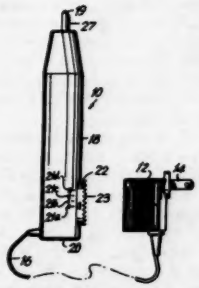
STIMULATOR

Philippe-Guy E. Woog, and Michel A. Moret, both of Geneva, Switzerland, assignors to Les Produits Associes LPA-Broxo S.A., Geneve, Switzerland

Filed Mar. 8, 1989, Ser. No. 320,711

Int. Cl.[5] A61H *1/00, 7/00, 19/00*

U.S. Cl. 128—32 **12 Claims**



1. A stimulator for sexual therapy including:

means for inducing rotational oscillation through an angle of operation between ten degrees and eighty degrees at a frequency substantially within the range of 2000 to 8000 cycles per minute;

a brushless attachment adapted to external female stimulation free of substantial insertion; and

means for attaching said attachment to said inducing means.

5,067,481

CONTROL DEVICE FOR AN AIR-BUBBLE MASSAGE APPLIANCE

Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic, GmbH, Fed. Rep. of Germany

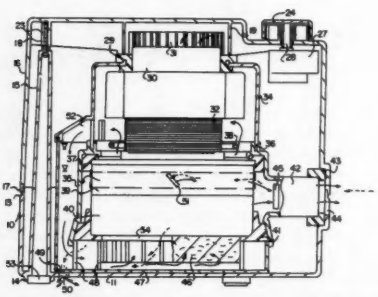
PCT No. PCT/DE89/00105, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO89/07927, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 23, 1989, Ser. No. 571,664

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806858

Int. Cl.[5] A61H 9/00

U.S. Cl. 128—66 26 Claims



1. A control device for an air-bubble massage appliance which comprises an external housing containing a blower which is drivable by means of an electric motor (32) and enclosed by a cover (39, 40), said external housing having a lower housing part (10) and an upper housing part (16) and containing an internal housing having a connecting piece (42) for an air hose, said connecting piece (42) extending toward said external housing and connecting to a hose connecting opening (44) of said external housing, said external housing and said internal housing having water discharge openings (49, 50), so that water returning into said internal housing through said connecting piece (42) is isolated from said electric motor (32) when said blower is shut off and can flow out of said internal and external housings, said lower housing part (10) and said upper housing part (16) connecting with each other in an airtight manner along a horizontal separation plane (17),

said internal housing having an aspirating hood (34) and a blower hood (35) connecting with each other in an airtight manner in a horizontal separating plane (36),

said electric motor (32) housed in said aspirating hood (34) above said blower hood (35) on its underside within said blower hood (35) driving at least a fan wheel on a vertical shaft surrounded by said cover (39, 40),

said electric motor (32) being held in an upper area of said aspirating hood (34) by means of a profile packing (29), creating an aspirating chamber (31) which is in contact with said external housing,

said cover (39, 40) having circumferentially positioned air outlet slits (51) and being sealed on both ends by means of profile packings (37, 41) against said blower hood (35),

said blower hood (35) having an open underside, at a distance from a floor (11) of said lower housing part (10), and further having an aspirating opening (54) which is connected to an aspirating conduit (52) which issues from an inner chamber of said aspirating hood (34),

said water discharge opening (50) being located in said floor (11) of said lower housing part (10), said floor (11) having at least one air aspirating opening (12),

said connecting piece (42) of said blower hood (35) being aligned horizontally and connected with said air exhaust slits (51) of said cover (39, 40) of said fan wheel,

said lower housing part (10) of said external housing having at least one air aspirating opening (12), and

said water discharge openings (49, 50) of said external housing and said internal housing overlapping each other in a lower area of said aspirating conduit (52) of said aspirating hood (34).

5,067,482

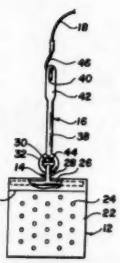
CONCEALED FACIAL SKIN UPLIFTING DEVICE

Helen B. Reid, The Summit, #2701, 999 Green St., San Francisco, Calif. 94133

Filed Feb. 15, 1991, Ser. No. 657,171

Int. Cl.[5] A61F 5/08

U.S. Cl. 128—76 B 6 Claims



1. A device for uplifting the facial skin of a wearer, the device comprising the combination of a pair of transparent pads having flat sides and a coating of adhesive on one side of each pad for releasably securing the pad to the underlying facial skin, a pair of flat, T-shaped connectors, each connector comprised of a crossbar integrally formed with a shank which extends orthogonally from the mid-portion of the crossbar, said connectors being formed of a compliant material which permits the crossbar and shank to yieldably change shape when stressed due to movement of the wearer's skin, said material of the connectors further being substantially transparent for concealing the connectors from view, means for securing the crossbar of each connector to an edge of each pad along substantially the entire lateral width of the pad whereby upward pulling forces applied to the connector are transferred uniformly to the pad across its width and thence to the facial skin over the entire area of the skin underlying the pad, an elongated flexible line of a length sufficient to extend over the wearer's head, said line having a pair of ends which hang down adjacent to the wearer's hairline on opposite sides of the face, a pair of elongated, flat tension strips having upper and lower ends, each strip being formed of a flexible elastomeric material which is light colored for reducing its visibility when in use, means for releasably attaching the upper end of the shank of each connector to the lower end of a respective one of the tension strips, means for releasably attaching the upper end of each tension strip to a respective one of the ends of said line, and clip means for gathering and adjustably securing a mid-portion of said line above the wearer's head concealed within the hair whereby the ends of the line apply upward pulling forces through the tension strips, connectors and adhesive pads to uplift the portions of the facial skin which underlie the pads.

5,067,483

CERVICAL TRACTION DEVICE

William L. Freed, 21 Fairway La., Trumbull, Conn. 06611

Filed Aug. 21, 1990, Ser. No. 570,322

Int. Cl.[5] A61S 5/00

U.S. Cl. 128—76 R 8 Claims

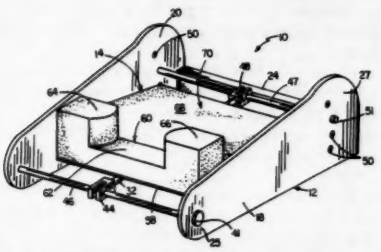
1. A cervical traction apparatus comprising:

a base,

a head support means, said head support means comprising a neck receiving portion and an occipital pad having a top surface, said occipital pad being of decreasing thickness with the thickest portion of said pad being adjacent to said neck receiving means and being approximately the same

height as said neck receiving portion and the thinnest portion of said pad being opposite said neck receiving portion so that said top surface is disposed at an acute angle from the plane of said neck receiving portion, said occipital pad being angled so that the back of the head of the patient and not the head and neck junction is in contact with the pad when in use, and

a drive means, said drive means being attached to said head support means and also being connected to said base, wherein when in use said drive means selectively moves



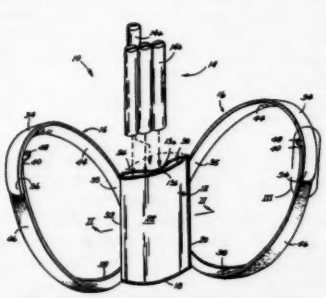
said head support means with respect to said base to apply cervical traction to a patient, the back of whose head is disposed on said occipital pad and whose neck is disposed in said neck receiving potion, said pad remaining in contact with the back of the patient's head as traction is applied, as the patient's head slips on said pad thereby avoiding pressure on the greater occipital nerve and artery and at the same time the angle of said pad tilting the patient's head forward providing cervical flexion for the patient.

5,067,484

POSTURE TRAINING SUPPORT WITH WEIGHT POCKETS

Carol L. Hiemstra-Paez, Spring Arbor, Mich., assignor to Camp International, Inc., Jackson, Mich.

Filed Sep. 6, 1990, Ser. No. 578,739
Int. Cl.[5] A61F *5/02*; A63B *21/00*
U.S. Cl. 128—78 **38 Claims**



1. A posture training support comprising:

a pouch for holding weight on the back of a patient, said pouch having length, width and thickness, said length and width defining an area which is significantly smaller than the area of the back of a median adult patient, said thickness being sufficiently thin so that said pouch can be unobtrusively worn under the patient'clothing;

means dividing the interior of said pouch into at least two separate pockets, each for holding a weight against excessive movement within said pocket and within said pouch;

at least one weight smaller in dimension than the interior dimensions of said pouch and comparable in dimensions to at least one of said pockets whereby said weight is snugly located in one of said pockets in said pouch; and

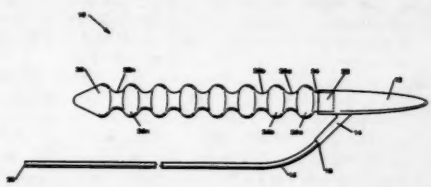
clavicle straps secured to said pouch for strapping said pouch onto a patient's back.

5,067,485

CORPUS CAVERNOSUM IMPLANT DEVICE

Timothy B. Cowen, Andover, Minn., assignor to Mentor Corporation, Minneapolis, Minn.

Filed May 14, 1990, Ser. No. 522,821
Int. Cl.[5] A61F *5/00, 2/04*
U.S. Cl. 128—79 **5 Claims**



1. An implantable penile prosthesis comprising:

a. a hollow inner cylinder of a flexible biocompatible material having an outer surface forming a plurality of smooth sinusoidal transitions from a minimum diameter to a maximum diameter in both a flaccid and a pressurized state, said plurality of sinusoidal transitions occupying a majority of the outer surface area of said inner cylinder;

b. a base mount sealingly attached to one end of said inner cylinder;

c. a source of pressurized fluid in fluid communication with said inner cylinder for pressurizing said inner cylinder; and

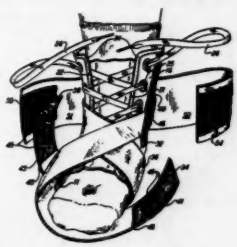
d. at least one ring member configured for attaching to said minimum diameter of at least one of said plurality of smooth sinusoidal transitions.

5,067,486

ANKLE STABILIZING APPLIANCE

John P. Hely, Charlotte, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed Mar. 28, 1990, Ser. No. 500,607
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—80 H **10 Claims**



8. An ankle stabilizing appliance adapted to provide protection against lateral ankle sprain during participation in sports activities, and comprising

a boot-like body member of flexible material and adapted to receive the ankle and the rear foot portion of the wearer therein, said body member comprising an ankle portion adapted to overlie the sides and rear of the ankle of the wearer and having a length sufficient to extend above the malleoli of the wearer, a foot portion adapted to extend under the foot of the wearer, and with said ankle portion defining an inside panel on one side of the ankle, an out-

side panel on the other side of the ankle, and a rear edge portion which extends vertically between the inside and outside panels and thus along the Achilles tendon of the wearer,

a pair of elongate non-elastic stabilizing straps, with said straps each having a first end fixed to said ankle portion at said rear edge portion thereof and at an elevation so as to be located above the malleoli of the wearer, and an opposite free end, and with said straps extending laterally in opposite directions and so as to define an inside strap extending from said rear edge portion toward said inside panel and an outside strap extending from said rear edge portion toward said outside panel,

first releasable closure means for releasably interconnecting said inside panel of said ankle portion and said free end of said inside strap, and second releasable closure means for releasably interconnecting said outside panel of said ankle portion and said free end of said outside strap,

a pair of binding straps, with said binding straps each having a first end fixed to said ankle portion at said rear edge portion thereof at an elevation corresponding to that of said stabilizing straps, and an opposite free end, and with said binding straps extending laterally in opposite directions and overlying said stabilizing straps, and pressure sensitive closure means attached to said free ends of said binding straps,

whereby said inside strap may be brought across said inside panel of said ankle portion, over the top of the wearer's foot, downwardly across the outside of the wearer's foot, under the wearer's foot, and then upwardly and so that said free end thereof may be releasably attached to said first closure means, and

whereby said outside strap may be brought across said outside panel of said ankle portion, over the top of the wearer's foot, downwardly across the inside of the wearer's foot, under the wearer's foot, and then upwardly so that said free end thereof may be releasably attached to said second closure means, and such that said binding straps are adapted to be looped about the ankle of the wearer and interconnected to each other and so as to overlie portions of said stabilizing straps.

5,067,487

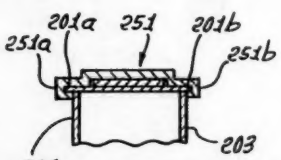
RESUSCITATOR

Jack Bauman, 2210 Wilshire Blvd. #705, Santa Monica, Calif. 90403

Continuation-in-part of Ser. No. 80,388, Jul. 31, 1987, Pat. No. 4,821,713, which is a continuation-in-part of Ser. No. 912,568, Sep. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 882,773, Jul. 7, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 313,157

Int. Cl.[5] A62B *7/00*

U.S. Cl. 128—205.13 **22 Claims**



1. A resuscitator for ventilating a patient comprising:

a ventilator mask means for sealingly surrounding the patient's mouth and nose;

a gas flow manifold having first, second, and third gas flow passage means for delivering ventilating gas from a source of ventilating gas to said mask means;

means for operatively coupling said third gas flow passage means to said mask means;

a manually collapsible gas receptacle;

means for operatively coupling said manually collapsible gas receptacle to said first gas flow passage means;

said second gas flow passage means being in flow communication with a source of ventilating gas;

said first gas flow passage means being operatively coupled to said third gas flow passage means and said second gas flow passage means being operatively coupled to said first gas flow passage means;

first one-way flow valve means mounted intermediate said second and first gas flow passage means for preventing flow from said first gas flow passage means to said second gas flow passage means and for allowing flow from said second gas flow passage means to said first gas flow passage means;

second one-way flow valve means mounted intermediate said first and third gas flow passage means for preventing flow from said third gas flow passage means to said first gas flow passage means and allowing flow from said first gas flow passage means to a said third gas flow passage means;

said first one-way flow valve means and said second one-way flow valve means being mounted so that when said manually collapsible gas receptacle is collapsed, said first one-way flow valve means prevents flow from said first gas flow passage means to said second gas flow passage means and said second one-way flow valve means allows flow fromsaid first gas flow passage means to said third gas flow passage means, and, when said manually collapsible gas receptacle expands, said first one-way flow valve means allows flow from said second gas flow passage means to said first gas flow passage means and said second one-way flow valve means prevents flow from said third gas flow passage means to said first gas flow passage means,

said third gas flow passage means including gas outlet means and means for closing said gas outlet means when said second one-way flow valve means allows flow from said first to said third gas flow passage means; and

air escape means mounted to a wall of said gas flow manifold and in flow communication with said gas outlet means, said air escape means including manually adjustable air vent means for controlling a minimum pressure at which air is allowed to pass from said third gas flow passage means through said gas outlet means and to atmosphere when said second one-way flow valve means prevents flow from said third gas flow passage means to said first gas flow passage means, thereby to provide positive end expiratory pressure (PEEP).

5,067,488

MASTICATION DETECTOR AND MEASUREMENT APPARATUS AND METHOD OF MEASURING MASTICATION

Eiichi Fukada, Kawasaki; Shigeru Saito, Zushi; Toshiharu Yagi, Toyonaka, and Yoshihide Higashihata, Settsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka and Shigeru Saito, Kanagawa, both of, Japan

Continuation of Ser. No. 341,953, Apr. 24, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 613,444

Claims priority, application Japan, Apr. 22, 1988, 63-100885

Int. Cl.[5] A61B *5/103*

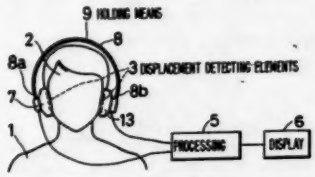
U.S. Cl. 128—777 **36 Claims**

1. An apparatus for detecting mastication, the apparatus comprising:

detecting means for detecting a displacement of a part of the side of a face, said detecting means comprising a flexible plate-like detecting element of a high-molecular weight polymer of piezoelectric material; and

holding means for securing said plate-like detecting element in a position in close contact with the part of the side of a

face, said holding means including a housing, a body of resilient material disposed in said housing and over which



body said detecting element is disposed, and a cover covering said detecting element and secured to said housing.

5,067,489

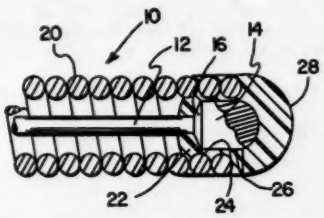
FLEXIBLE GUIDE WITH SAFETY TIP

Stuart J. Lind, Minneapolis, Minn., assignor to Flexmedics Corporation, Minneapolis, Minn.

Continuation of Ser. No. 232,721, Aug. 16, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 604,360

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—772 **7 Claims**



1. A guide wire comprising an elongated flexible metal core, an elongated, helically wound wire coil having a forward end and providing the guide wire with a flexible tip, the core having a forward portion of reduced diameter extending forwardly within the tip and terminating forwardly in an enlarged diameter portion integrally formed with the core and defining a plug carried adjacent the forward end of the coil, the plug having a diameter approximately equal to the inner diameter of the coil at its forward end and substantially filling the inner lumen of the coil adjacent its forward end, and a bonding agent bonding the plug to the coil.

5,067,490

SINGLE USE, SAFETY BLOOD COLLECTING DEVICE

Terry M. Haber, El Toro, Calif., assignor to Habley Medical Technology, Corp., Laguna Hills, Calif.

Continuation of Ser. No. 141,019, Jan. 5, 1988, Pat. No. 4,892,107. This application Jun. 14, 1989, Ser. No. 366,009

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—763 **2 Claims**

1. A blood collection device comprising:

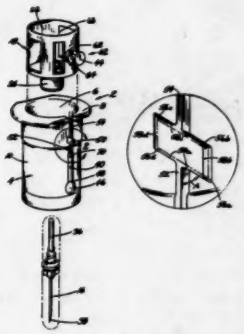
an outer sleeve and an inner needle carrier for receiving a double-pointed needle;

said outer sleeve including a longitudinally extending slot having first and second locations;

said inner needle carrier being mounted within said outer sleeve for axial movement between the first location, at which said needle is adapted to project from said outer sleeve in an exposed position for drawing blood, and the second location, at which said needle is adapted to be fully disposed within said outer sleeve in a retracted position after use;

said inner needle carrier including an actuator, movable radially and longitudinally relative to the outer sleeve, passing through the slot;

detent means, at the first location, cooperatively defined by the actuator and the slot in the outer sleeve, for releasably holding said inner needle carrier at the first location for use of the needle;



locking means, at the second location, cooperatively defined by the actuator and the outer sleeve, for non-releasably locking said inner needle carrier at said second location after the use of the needle; and

the actuator and the slot configured so the actuator is in first and second radial positions relative to the sleeve when the inner needle carrier is in the first and second locations.

5,067,491

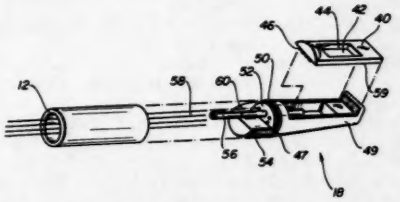
BARRIER COATING ON BLOOD CONTACTING DEVICES

Maylon S. Taylor, II, Raleigh, and Joel L. Williams, Cary, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 8, 1989, Ser. No. 448,034

Int. Cl.[5] A61B *5/0215*

U.S. Cl. 128—748 **16 Claims**



1. A blood pressure monitoring device comprising:

(a) A silicon pressure transducer including an integral micromachined diaphragm forming the bottom wall of said transducer, said diaphragm flexing in response to a change in blood pressure exerted on a first side of said diaphragm, said transducer converting said change in pressure to an electrical signal;

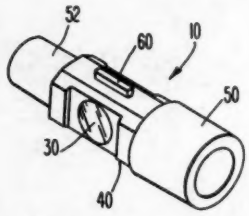
(b) a flexible polymeric tubing having said element mounted in a distal end thereof, said tubing enclosing conducting means for conducting said signal away from said transducer; and

(c) a parylene coating on said transducer and at least a portion of said tubing, said coating insulating said transducer and conducting means from water vapor and ions when said device is placed in a patient's blood stream for up to eight days and longer.

5,067,492
DISPOSABLE AIRWAY ADAPTER

Mark Yelderman, Plano, Tex.; Daniel S. Goldberger, San Francisco, and James R. Braig, Oakland, both of Calif., assignors to Critikon, Inc., Tampa, Fla.

Filed Aug. 7, 1990, Ser. No. 564,179
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—719 **6 Claims**



1. An endotracheal airway adapter for single patient use in proximity of a patient's mouth during quantitative measurement of the concentration of respiratory gases of the patient by a respiratory gas analyzer having infrared transmission and detection means and means for housing said infrared transmission and detection means, said airway adapter comprising:

a substantially tubular plastic portion made of material which is slightly deformable and having oppositely disposed openings in a width-wise direction thereof;

at least two windows formed of a thin layer of plastic, said windows being disposed in said openings of said tubular plastic portion so as to be a predetermined distance from each other during measurement of said concentration of respiratory gases by said infrared transmission and detection means of said respiratory gas analyzer; and

means for positioning said tubular plastic portion in said housing means of said respiratory gas analyzer such that said tubular plastic portion is slightly deformed to thereby dispose and maintain said windows in a predetermined spaced configuration between said infrared transmission and detection means during measurement of said concentration of respiratory gases by said respiratory gas analyzer, whereby compensation for differential absorption effects of said windows prior to each use is not necessary.

5,067,493
LITHOTRIPSY SYSTEM USING ULTRASOUND TO LOCATE CALCULI

Dan Inbar, Haifa; Daniel I. Barnea, Tel Aviv, and Abraham Bruck, Haifa, all of Israel, assignors to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 293,768, Jan. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 79,927, Jul. 31, 1987, abandoned, which is a division of Ser. No. 737,532, May 24, 1985, abandoned. This application Jul. 11, 1990, Ser. No. 551,656
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—660.03 **5 Claims**

1. A lithotripsy system having:

shock wave generator means for generating shock waves to destroy calculi,

a calculi locator in combination with said shock wave generator means for obtaining an image of the calculi and for locating said calculi in a patient,

said shock wave generator means comprising:

an ellipsoidal reflector having a longitudinal axis,

spark terminals located at a source focal point in said ellipsoidal reflector,

a target focal point spaced apart from said spark terminals,

said calculi locator comprising:

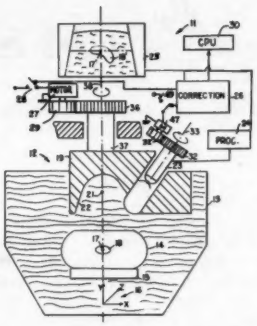
ultrasound transducer scanning means for transmitting ultrasound waves and receiving echo waves,

means for using said echo waves from said transducer means for acquiring an image of the location of said calculi in said patient,

means for assuring coincidence of the true location of the calculi and the shock wave generator means target focal point,

said means for assuring coincidence including:

means for mounting said transducer means on said ellipsoidal



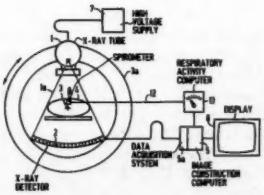
reflector spaced apart from said longitudinal axis of said ellipsoidal reflector for obtaining different views of the calculi at different locations of said transducer means around the longitudinal axis of said ellipsoidal reflector, and

means for correcting for refraction of the waves by changing the patient position to maintain said calculi at the target focal point in said different views.

5,067,494
DEVICE FOR GENERATING TRIGGER SIGNALS FOR A MEDICAL APPARATUS DEPENDENT ON THE RESPIRATORY ACTIVITY OF A PATIENT

Rainer Rienmueller, Munich; Willi Kalender, Kleinseebach, and Wolfgang Seissler, Uttenreuth Weiher, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,414
Claims priority, application European Pat. Off., Jan. 12, 1989, 89100472.3
Int. Cl.[5] A61B *6/03*
U.S. Cl. 128—653.1 **1 Claim**



1. A medical diagnostic apparatus comprising:

a spirometer having a channel therein adapted to be traversed by the respiratory air of a patient, a turbine having a plurality of blades and being rotatably mounted in said channel so as to be rotated by respiratory air;

opto-electrical transducer means disposed in said spirometer and having a light path modulatable by rotation of said turbine blades for generating an electrical signal at a point in the respiratory cycle of the patient dependent on the rotation of said turbine and thus on the flow of respiratory air in said channel;

first computer means to which said electrical signal is sup-

plied for generating a trigger signal at said point in the respiratory cycle and including means for setting a respiratory trigger threshold to select said point in said respiratory cycle;

a computer tomography imaging system connected to said first computer means, said computer tomography imaging system including means for conducting a scan of a patient consisting of a plurality of exposures of said patient respectively triggered by said trigger signal and for generating scan data during each exposure, and also including second computer means for constructing an image of the scanned region of said patient from said scan data, said first computer means including means for generating and supplying a signal to said second computer means in said computer tomography imaging system for marking respiratory activity at said point in said respiratory cycle within said scan data; and

said spirometer also including means disposed in said channel connected to and operable by said first computer means for completely blocking inspiration and expiration in said channel when said respiratory trigger threshold is reached.

5,067,495

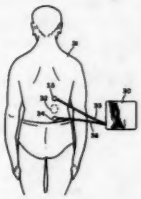
ELECTRO WAVE THERAPY

Richard L. Brehm, Rte. 9, Box 205B, Chippewa Falls, Wis. 54729

Continuation-in-part of Ser. No. 413,276, Sep. 27, 1989, abandoned. This application Apr. 30, 1990, Ser. No. 516,353

Int. Cl.[5] A61N *1/18*

U.S. Cl. 128—421 **19 Claims**



1. A method of treatment of chronic pain to a user having an area of the body that is responsible for the pain comprising the steps of:

applying a first electrode to the body with said first electrode spaced from the area of the body that is responsible for the chronic pain;

applying a second electrode to the body with said second electrode spaced from the area of the body that is responsible for the chronic pain;

applying an electrical signal having a monophasic wave form comprising a series of sequential wave burst cycles, said wave burst cycles including a wave burst having individual waves each having a positive pulse followed by a negative pulse with each of the sequential wave bursts followed by a pause, said electrical signal applied across said electrodes to thereby direct the electrical signal having the monophasic wave form into the body for a period of time sufficient to relieve the chronic pain in the body after the treatment has been terminated.

5,067,496

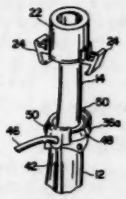
TRACHEOSTOMY TUBE

Robert F. Eisele, Laguna Niguel, Calif., assignor to Shiley Incorporated, Irvine, Calif.

Filed Apr. 7, 1988, Ser. No. 178,661

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.15 **13 Claims**



1. A tracheostomy tube for insertion into the trachea of a patient to support breathing, comprising:

An outer cannula having a distal end for placement within the trachea and a proximal end for placement outside of the trachea;

a neck flange connected to the proximal end of said outer cannula for securing the tracheostomy tube to the patient;

inflatable sealing means near the distal end of said outer cannula for forming a seal with the tracheal walls;

a flexible inflation tube extending from within said sealing means and having a portion fixedly secured along the wall of said outer cannula near the proximal end of said outer cannula and said inflation tube further extending unsecured; and

means retaining a portion of said unsecured inflation tube at the proximal end of said outer cannula in longitudinal alignment with said secured portion, whereby any pulling force on said inflation tube proximal of said retaining means results is substantially only tensile force on the secured portion of said inflation tube.

5,067,497

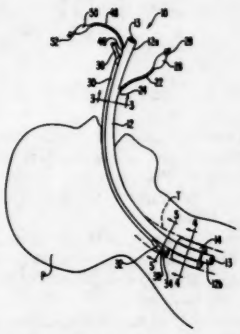
INTUBATION DEVICE WITH ADJUSTABLE SUCTION MEANS ABOVE THE CUFF

John Greear, Leeds, and Marc W. Fournier, Auburn, both of Me., assignors to Progressive Medical Design, Inc., Auburn, Me.

Filed Mar. 16, 1990, Ser. No. 494,464

Int. Cl.[5] A61M *16/00, 29/00, 25/00*; A62B *9/06*

U.S. Cl. 128—207.15 **23 Claims**



1. A tubular assembly for intubation within a body passageway comprising:

a main tube body defining a primary lumen through which fluid can pass;

a means for holding and sealing said main tube body to the

body passageway during intubation so that fluid passing into or out of the body passageway passes through said primary lumen;

a suction tube secured to said main tube body defining between sidewalls thereof an unobstructed suction passageway, said suction tube having an adjustable free end portion not directly connected to said main tube body and movable relative thereto, said adjustable free end portion being provided with a suction opening; and

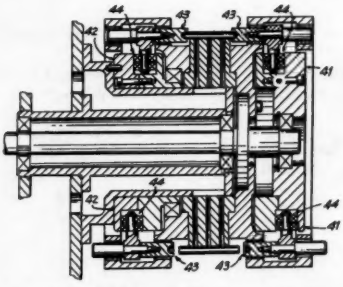
actuating means independent of the means for holding and sealing the main tube body and located adjacent said suction opening, for selectively radially adjusting said suction opening with respect to said main tube body, said actuating means being positioned between said adjustable free end portion of said suction tube and said main tube body to move said suction opening between an innermost position adjacent said main tube body and a radially outermost position, independently of the means for holding and sealing the main tube body.

5,067,498

TUBE CUTTING AND FORMING APPARATUS

Jack C. Wheless, Richmond; Billy J. Keen, Jr., Chesterfield, and Renzer R. Ritt, Sr., Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 25, 1989, Ser. No. 385,006
Int. Cl.[5] A24C *5/00*
U.S. Cl. 131—88 **20 Claims**



1. An apparatus for cutting and subsequently forming the ends of a tube, comprising:

transferring means for transferring said tubes to be cut and formed from a hopper means to a first cutting operation;

first cutting means adjacent to said transferring means for receiving said tubes from said transferring means and for cutting said tubes;

aligning means adjacent to said first cutting means for receiving portions of said cut tubes from said first cutting means and for aligning said portions of said cut tubes in a particular orientation;

forming means adjacent to said aligning means for receiving said portions of said cut tubes from said aligning means for forming the ends of said portions of said cut tubes; and

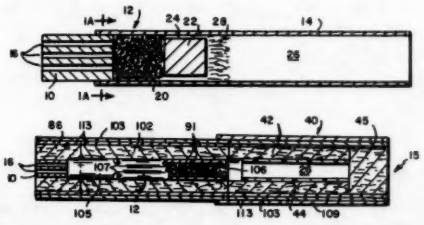
second cutting means adjacent to said forming means for receiving said portions of said cut tubes from said aligning means for again cutting said portions of said cut tubes.

5,067,499

SMOKING ARTICLE

Chandra K. Banerjee, Pfafftown; Ernest G. Farrier, Winston-Salem; James L. Harris, Westfield; Alan B. Norman, Clemmons; James L. Resce, Yadkinville; John H. Reynolds, IV, Winston-Salem; Henry T. Ridings, Lewisville; Andrew J. Sensabaugh, Jr.; Michael D. Shannon, both of Winston-Salem, and Gary R. Shelar, Greensboro, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 800,064, Nov. 20, 1985, Pat. No. 4,854,331, which is a continuation-in-part of Ser. No. 650,604, Sep. 14, 1984, Pat. No. 4,793,365, and Ser. No. 684,537, Dec. 21, 1984, abandoned, and Ser. No. 769,532, Aug. 26, 1985. This application Aug. 21, 1987, Ser. No. 88,381
Int. Cl.[5] A24D *1/00, 1/02, 1/04*
U.S. Cl. 131—194 **88 Claims**



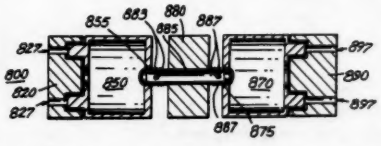
1. A carbonaceous fuel element for smoking articles, said fuel element having at least one longitudinal passageway, and a length of about 20 mm or less prior to smoking.

5,067,500

CONTAINER FOR ADDITIVE MATERIALS FOR SMOKING ARTICLES

Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 342,239, Apr. 24, 1989, Pat. No. 4,991,605. This application Nov. 20, 1990, Ser. No. 616,197
Int. Cl.[5] A24D *3/04*
U.S. Cl. 131—335 **1 Claim**



1. A container for an additive material for modifying the characteristics of a smoking article comprising:

a first element having a first end, side walls, and a second end defining a chamber for containing said additive material, said first element having a first perforation extending through said first element proximate to said first end;

a second element having a closed end and side walls connected to said closed end, said second element having a second perforation extending through said second element proximate to said closed end; and

means for movably interconnecting said first and second elements in a close relation between one of a first and second positions, said first position having said second perforation exterior to said chamber and providing an hermetically sealed interface between said first and second elements, said second position having said second perfora-

tion interior to said chamber and providing an airflow pathway between said first and second elements so that said additive material can modify the characteristics of the smoking article.

5,067,501

FLUID APPLICATOR FOR HAIR CONDITIONING

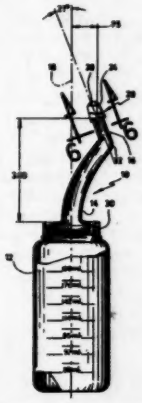
Ronald Y. Auger, 8576 St. Denis, Montreal, Quebec H2P 2H2, Canada

Filed Feb. 19, 1991, Ser. No. 656,981

Claims priority, application United Kingdom, May 31, 1990, 9012150

Int. Cl.[5] A45D *24/22*

U.S. Cl. 132—116 **8 Claims**



1. An outlet nozzle adapted to be fixed to a substantially cylindrical and collapsible hair conditioning bottle for dispensing liquid on an outward surface of a lock of hair of a human scalp, said nozzle comprising a rigid hollow tubular member and a dispensing tip fluidly connected at one end of said tubular member opposite the bottle, said tubular member having two continuous longitudinal portions being angularly disposed relative to each other, one of said portions adapted to extend at an angle away from the longitudinal axis of said bottle and the other portion extending towards said axis at an angle therewith and up to a location adjacent said axis, said dispensing tip comprising a pair of flat tooh-like projections spacedly facing each other and extending from a free end of said other portion substantially in the same direction as said other portion to define an archway, said projections of said archway adapted to contact the scalp and to be slidable through the hair to define said lock of hair, said other portion being provided with an aperture between said projections and at the intersection of said other portion and the bottom of said archway for allowing the dispensing of the fluid from said bottle onto said outward surface of the lock adapted to face said other portion, said tooth-like projections adapted to hold a portion of said lock of hair therebetween while said liquid is dispensed on said outward surface of said portion of the lock.

5,067,502

HAIR TRIMMING GUIDE HAVING AN ADJUSTABLE COMB

Anthony D'Orsi, 2322 62 St., Brooklyn, N.Y. 11204, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Feb. 20, 1991, Ser. No. 658,332

Int. Cl.[5] A45D *24/34*

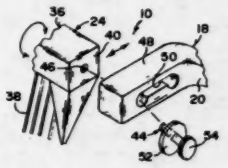
U.S. Cl. 132—213.1 **3 Claims**

1. A hair trimming guide implement which comprises:

a) a handle adapted to be grasped by a hand of a person;

b) a Y-shaped shank having a pair of spaced arms extending from one end of said handle; and

c) two combs one of each said combs extending from one of each of said arms of said Y-shaped shank on said handle in a spaced apart relationship so that one of said combs can bear against the scalp while excess hair extending through the other of said combs can be trimmed off the head of another person with a scissors, wherein each of said



combs includes a spine having a set of teeth projecting therefrom, whereby one end of each said spine is connected to one of said arms said hair trimming guide implement, further including means for adjusting individually the angle between said sets of teeth and the transverse space between said spines so that said implement can accomodate various hair lengths and hair thickness when used as a guide in trimming hair.

5,067,503

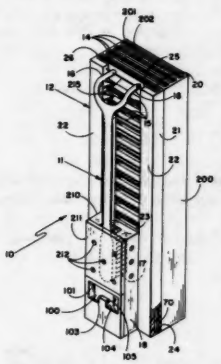
DENTAL APPARATUS FOR FLOSSING TEETH

Thomas W. Stile, 4858 Bryce Ave. E., Inver Grove Hts., Minn. 55075

Filed Mar. 21, 1990, Ser. No. 497,115

Int. Cl.[5] A61C *15/00*

U.S. Cl. 132—324 **22 Claims**



1. A dental apparatus for manipulating dental floss comprising:

(a) a hand tool with a handle and two spaced apart extensions,

(b) a thread section for flossing teeth and having two end portions,

(c) tool connecting means affixed to each of the end portions of the thread section for connecting the thread section between the extensions of the tool, the tool connecting means being greater in width than the thread section,

(d) housing means for movably engaging a plurality of tool connecting means and accompanying thread sections such that the tool connecting mean are accessible for the tool extensions, and

(e) discarding means including storage means on the housing

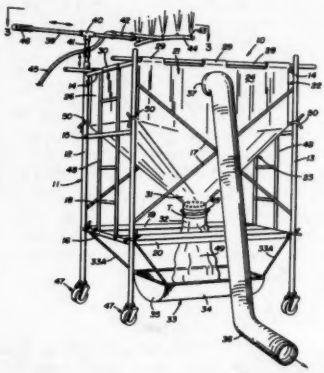
means for engaging a plurality of tool connecting means for discarding and storing the thread sections.

5,067,504

ASBESTOS COLLECTION AND CONTAINMENT DEVICE

Seab H. Coleman, III, P.O. Box 43001, Richman Heights, Ohio 44143

Filed Nov. 21, 1990, Ser. No. 616,906
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—172 **6 Claims**



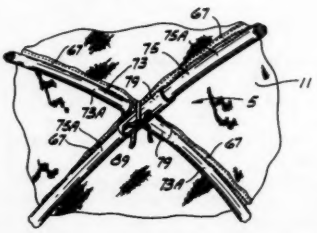
1. An asbestos collection and containment device for use in removing hazardous material, such as asbestos from overhead work areas comprising, an adjustable support scaffold, a flexible multi-walled containment enclosure within said support scaffold, said flexible containment enclosure having an opened upper portion and a funnel shape lower portion, said lower portion having an outlet means projecting outwardly beyond and from said lower portion within said support scaffold, ventilation means within said upper portion adjacent said open end thereof, wetting means extending from said support scaffold for indirect contact with said work area.

5,067,505

TENT

Robert R. Cantwell, and Deborah M. Zumsteg, both of New Haven, Mo., assignors to American Recreation Products, Inc., St. Louis, Mo.

Filed Dec. 1, 1989, Ser. No. 444,769
Int. Cl.[5] E04H *15/10*
U.S. Cl. 135—104 **5 Claims**



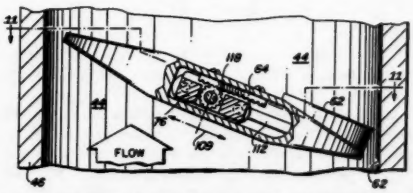
1. A tent comprising a shell of flexible tent material having an interior surface, an exterior surface, and a bottom, an internal frame comprising a plurality of poles for supporting the shell internally of the shell, and a plurality of exit openings, one for each pole, in the shell generally adjacent the bottom of the shell whereby a single person outside of the shell may erect the tent by inserting each pole, end first, into the interior of the tent through a respective exit opening in the shell and moving the pole across a floor of the tent to a position in which one end of the pole engages a bottom portion of said interior surface of the shell at a side of the tent generally opposite the exit opening and the other end of the pole projects out of the tent through said exit opening, said pole thereafter being adapted to be moved by said person to an erect position in which the pole is engageable with an overhead portion of said interior surface of the shell for holding the tent erect, means on the shell for holding said other end of each pole projecting out through the exit opening when the pole is erect, and means on said overhead portion of the interior surface of the shell engageable with the poles only after they have been erected for releasably holding the poles erect.

5,067,506

FLIGHT CRAFT WITH FLUID SYSTEMS WHICH INCORPORATE BUTTERFLY VALVES, AND BUTTERFLY VALVE METHODS AND APPARATUS

Larry K. Ball, Chandler; Marshall U. Hines, and John N. Tervo, both of Scottsdale, all of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 374,897, Jun. 30, 1989, and a continuation-in-part of Ser. No. 533,965, Jun. 6, 1990, and a continuation-in-part of Ser. No. 538,809, Jun. 15, 1990. This application Jun. 26, 1990, Ser. No. 543,991
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] F16K *1/22*
U.S. Cl. 137—1 **14 Claims**



6. A method for facilitating control of a butterfly valve through which a fluid is being conveyed, wherein the valve comprises a valve plate which is rotationally positionable in a flow path to modulate flow of the fluid, and a pivot mechanism cooperating with the valve plate to define a pivot axis that geometrically divides a surface of the plate into two areas, the valve plate being pivotable about the axis so that the fluid exerts a net torque on the valve plate, the method comprising the step of:

a controllably altering the net torque when the valve plate is at a rotational position permitting fluid flow through the valve by effecting relative translational movement between the valve plate and the pivot mechanism in a direction which effects an increase in one of the two areas and a decrease in the other.

5,067,507

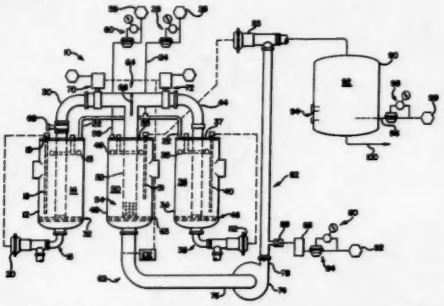
LIQUID PROPORTIONER APPARATUS AND METHOD

Gunnar Bjerklund, Rolling Meadows; William C. Ore, Elmhurst; Casimir Pulawski, Chicago, and Luigi Notardonato, Park Ridge, all of Ill., assignors to Universal Beverage Equipment, Inc., Willowbrook, Ill.

Filed Feb. 11, 1991, Ser. No. 653,719
Int. Cl.[5] G05D *11/035*
U.S. Cl. 137—3 **16 Claims**

13. A method of proportioning and admixing at least two liquids comprising the steps of:

providing a pressurizable reservoir for each liquid;
providing liquid in the liquid reservoirs;
providing a mix reservoir having means for discharging the admixture from the mix reservoir;
providing means for achieving fluid communication between the interior of the mix reservoir and the interior of each of the liquid reservoirs;



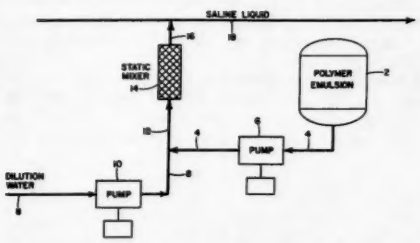
sensing a flow/no flow condition in the admixture discharging means to generate a condition signal indicating whether or not there is flow; and
providing means responsive to the condition signal for permitting or suspending the flow of liquids to the mix reservoir.

5,067,508

ACTIVATION OF WATER-IN-OIL EMULSIONS OF FRICTION REDUCING POLYMERS FOR USE IN SALINE FLUIDS

Yung N. Lee, and Fred R. Wiggins, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 16, 1990, Ser. No. 614,408
Int. Cl.[5] F17D *1/16*
U.S. Cl. 137—13 **19 Claims**



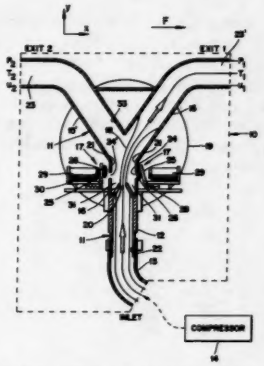
1. A process for reducing the fluid flow friction loss of a fluid comprising a saline liquid which is being transported through a conduit which comprises:
(a) combining a water-in-oil emulsion of a water soluble friction reducing polymer with water;
(b) subjecting the combination of water and emulsion to mixing to invert the emulsion; and
(c) introducing the inverted emulsion and water directly and continuously into the transported fluid.

5,067,509

GAS JET ACTUATOR USING COANDA EFFECT

Ian W. Hunter, Montreal, Canada, assignor to The Royal Institution for the Advancement of Learning (McGill University), Montreal, Canada

Filed Jul. 2, 1990, Ser. No. 546,742
Int. Cl.[5] F15C *1/08*
U.S. Cl. 137—14 **15 Claims**



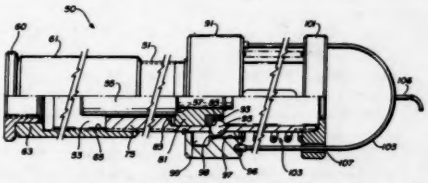
1. A method of imparting a controllable vibration to a vibratable object, said method comprising:
(i) attaching a gas jet actuator device to said object, said device having conduit means defining an inlet section and a fork section downstream of said inlet section to define diverging outlet sections disposed at predetermined angles, a nozzle in said conduit means upstream of said fork section, and switching means to cause a fluid jet stream from said nozzle to flow in an alternating sequence to said outlet sections by the Coanda effect;
ii) connecting a flexible conduit to said inlet section and to a remote pressure source;
(iii) applying a predetermined gas pressure to said inlet section; and
(iv) actuating said switching means to cause said jet stream to alternate between said outlet sections at frequencies within a predetermined frequency range of up to at least 100 Hz to impart controlled vibrations to said vibratable object.

5,067,510

ADJUSTABLE, FUSIBLE, MANUALLY OPERABLE VALVE LOCK-OPEN ASSEMBLY

Craig B. Breaux, Houma; Denny Cawyer, Metairie; Dwight Duplantis, Houma, and Don Hiller, Slidell, all of La., assignors to Axelson, Inc., Longview, Tex.

Filed Feb. 11, 1991, Ser. No. 654,066
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—77 **19 Claims**



1. An actuator shaft heat-sensitive locking apparatus comprising:
a cylindrical housing with an axial bore;

a shaft link in the bore movable axially between first and second positions;

means movably extending through the housing partially blocking the bore;

fusible element means slidably mounted in the bore between the shaft link and the bore blocking means, the fusible element having a solid state for preventing movement of the shaft link by engaging the bore blocking means and a heat responsive state for allowing movement of the shaft; and

means surrounding the cylindrical housing and in operative association with the bore blocking means for axial movement between first and second positions such that, in its first position, the bore blocking means prevents movement of the shaft link and the fusible element and, in its second position, the bore blocking means moves out of the bore enabling the shaft to move with the fusible element to its second position.

5,067,511

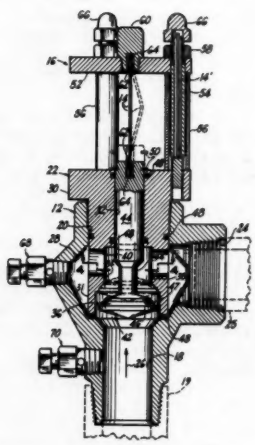
HIGH PRESSSURE FLUID EMERGENCY SHUTOFF VALVE

Julian S. Taylor, 8300 SW. 8th, Oklahoma City, Okla. 73128

Filed May 6, 1991, Ser. No. 695,830

Int. Cl.[5] F16K *17/00*

U.S. Cl. 137—67 **5 Claims**



1. A high pressure fluid flow line emergency shutoff valve, comprising:

a valve body having an inlet port and an outlet port forming a fluid passageway interposed in the flow line;

a valve seat intersecting the fluid passageway;

normally open valve means movably supported by said body for movement toward said valve seat and closing the fluid passageway; and,

axially collapsible pin means for normally biasing said valve means toward a fluid passageway open position and releasing said valve means for seating on said valve seat in response to a predetermined value of fluid pressure in the fluid passageway.

5,067,512

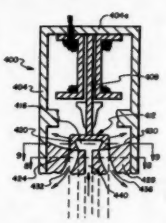
SERVOVALVE APPARATUS FOR USE IN FLUID SYSTEMS

Stephen C. Jacobsen; Edwin K. Iversen; David F. Knutti, and Clark C. Davis, all of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah

Division of Ser. No. 473,301, Jan. 31, 1990, Pat. No. 5,012,836. This application Jan. 22, 1991, Ser. No. 644,271

Int. Cl.[5] G05D *16/20*

U.S. Cl. 137—83 **14 Claims**



1. A servovalve apparatus for use in fluid systems in controlling the flow of a fluid stream comprising

an elongate flexible valve element having a fixed end and a free end which is moveable back and forth along a generally arcuate path,

receiving plate means which defines a generally arcuate surface area adjacent to the arcuate path, said receiving plate means having a bore terminating at a location along the arcuate surface area for carrying the fluid stream to the arcuate path, and at least one fluid channel terminating at the arcuate surface area adjacent to the bore,

cup means mounted on the free end of the valve element for receiving the fluid stream from the bore and porting it into the fluid channel when the free end is deflected to a certain position, and

means for selectively deflecting the free end of the valve element to said certain position and out of said certain position.

5,067,513

THERMOSTATIC PRESSURE BALANCED VALVE ASSEMBLY

James R. Nicklas, Noblesville, Ind.; Gerald Bright, Birmingham, Mich.; Eric V. Pullen, deceased, late of Ormond Beach, Fla. by Antoinette D. Pullen, Legal Representative , and James R. Nicklas, Noblesville, Ind., assignors to Masco Corporation, Ind.

Division of Ser. No. 440,956, Nov. 22, 1989, Pat. No. 4,978,059, which is a division of Ser. No. 247,781, Sep. 20, 1988, Pat. No. 4,905,732, which is a continuation of Ser. No. 763,445, Aug. 7, 1985, Pat. No. 4,915,295. This application Sep. 28, 1990, Ser. No. 589,962

Int. Cl.[5] G05D *11/03*

U.S. Cl. 137—98 **12 Claims**

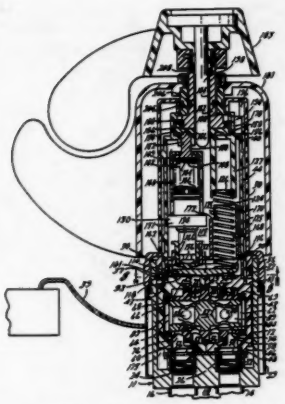
11. A proportioning valve comprising:

a housing defining a chamber;

a valve plate fixed to move with said housing, said valve plate having at least two inlets aligned with at least two fluid supply lines outside of said housing, and means to move said housing and said valve plate to vary the alignment of said inlets with the fluid supply lines and thus vary the amount of fluid passing from the fluid supply lines into said chamber; and

a spool valve disposed within said chamber, flow from the first and second supply lines being directed to opposed

sides of said spool valve such that the pressure on said spool valve from the first and second fluid supply lines



acts to move said spool valve to restrict the flow from the fluid supply lines into said chamber.

5,067,514

APPARATUS FOR TAPPING A FLUID THROUGH A WALL

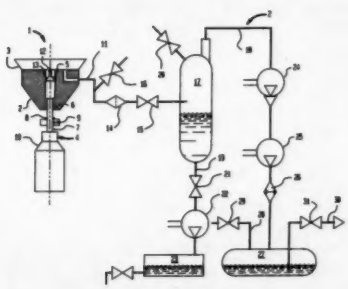
Geert H. Leemput, Dr. Bekenkampstraat 35, 9641 BR Veedam, and Herman Leemput, Torenstraat 60, 9643 CV Wildervank, both of Netherlands

Filed Aug. 24, 1990, Ser. No. 573,349

Claims priority, application Netherlands, Aug. 25, 1989, 8902158

Int. Cl.[5] F16L *41/04;* B23B *41/08;* F16K *43/00*

U.S. Cl. 137—318 **19 Claims**



1. An apparatus for tapping a refrigerant gas through a comprising: a vacuum source (**24**), a tapping head (**1**) provided at the front thereof with a circumferential seal (**3**) for bounding a contact area of the wall, perforating means (**4**) to be brought into a position extending through the contact area for forming an opening in the wall, at least one conduit (**11, 111, 211**) communicating with a space bounded by the seal (**3**) and the contact area for discharging air from the space and for discharging refrigerant gas flowing through the opening, and separating means connected to said conduit and operative in response to said vacuum source for separating contaminants from the air and refrigerant gas so that the contaminants can be directed to a collection means, said separating means further comprises means for transforming the refrigerant gas to a pre-defined state so that the refrigerant gas and the air can be separately withdrawn and to substantially prevent the refrigerant gas from escaping to a surrounding atmosphere.

5,067,515

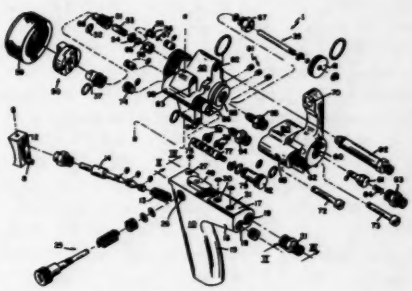
COMPACT SPRAY GUN

James E. Smith, St. Petersburg, Fla., assignor to Graves Spray Supply, Inc., Clearwater, Fla.

Division of Ser. No. 436,026, Nov. 14, 1989, Pat. No. 4,948,048, which is a division of Ser. No. 330,460, Mar. 30, 1989, Pat. No. 4,925,104, which is a division of Ser. No. 150,142, Jan. 29, 1988, Pat. No. 4,848,665. This application Jun. 15, 1990, Ser. No. 538,737

Int. Cl.[5] F16K *51/00*

U.S. Cl. 137—327 **2 Claims**



1. A packing cartridge assembly for use in a bore of a spray gun comprising:

a packing housing to be inserted through a first end of said bore,

a packing press and a packing substance within said packing housing,

adjustment means to be threadably received in said first end of said bore for adjustable compressing said packing press and said packing substance against said packing housing, and

tool means on said adjustment means for receiving a tool inserted at first end of said bore to provide rotation of said adjustment means causing the packing substance to be adjustably compressed.

5,067,516

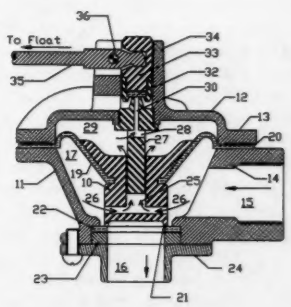
VALVE ASSEMBLY

Keith F. Gale, 33 Kennedy Street, Glen Waverley, Victoria, 3150, Australia

Filed Sep. 17, 1990, Ser. No. 583,200

Int. Cl.[5] F16K *31/34, 33/00*

U.S. Cl. 137—414 **9 Claims**



9. A pilot-operated, diaphragm-controlled, float valve assembly with a two-segment split casing comprising upper and lower segments with mating flanged edges joined to form a main valve cavity, a side fluid inlet and a bottom fluid outlet both formed in the lower segment, fluid entering the inlet flowing onto a main valve annular seat surrounding the bottom

outlet, a flexible, self-supporting diaphragm with a flanged edge mounted between the casing segments and dividing the valve cavity into upper and lower chambers, the diaphragm being dish-shaped with an intermediate, upwardly directed and convexly curved rim portion causing it to be self-biased towards the main valve annular seat, the diaphragm also having a central aperture with a main valve disc mounted therein for vertical reciprocating movement between the valve chambers in association with movement of the diaphragm, the main valve disc having a concave, cup-shaped, frusto-conical upper portion and a cylindrical lower portion with an external circumferential, flat-walled channel into which there is adapted to be fitted a flanged inner edge forming a central circular aperture of the diaphragm for mounting the main valve disc onto the diaphragm, the lower portion of the main valve disc also having a continuous, sealed, bottom surface formed with a flat-topped peripheral annular wall forming a sealing surface for the main valve annular seat and being held in a normally full-closed position against the main valve seat by bias of the diaphragm to prevent fluid backflow from the outlet to the inlet under conditions of low fluid pressure, the main valve disc having an axial bore extending partly through the length thereof from the top of the disc to a first closed endwall above the continuous sealed bottom of the disc, said first endwall defining at least one radial port extending from the outer periphery of said valve disc and into the interior of said valve disc axial bore and said valve disc being adapted to reciprocate axially along a fixed, vertical guide post centrally mounted upon and subtending from inside the top of the upper casing segment, an annular restricted flow passage being formed between the bore of the valve disc and outer surface of the fixed guide post, an axial bore extending through an upper portion only of the fixed guide post and joining a transverse bore therein which extends completely therethrough, said guide post axial bore ending at a second closed endwall which defines at least one radial port extending from the outer periphery of said guide post and into the interior of said guide post axial bore, a lower portion of the main valve disc also having a transverse bore extending completely therethrough in fluid communication with the axial bore through said valve disc radial port whereby fluid is able to enter the main valve upper chamber through said valve disc radial port into said valve disc axial bore along the exterior of said guide post when the main valve disc axial bore endwall abuts said guide post and when the main valve and the pilot valve are each in a fully open position, opening and closing of the main valve disc resulting in part from fluid pressure differentials between the main valve lower chamber and the upper chamber, closing movement of the main valve disc being due to surface area under pressure of the main valve disc facing the upper chamber being greater than the surface area under pressure of said disc facing the lower chamber due to the bottom of the disc facing a low pressure bottom fluid outlet, the pilot valve is mounted within the upper casing segment and comprises a piston reciprocatable within a cylinder in association with movement of a float lever arm pivotally mounted on the upper casing segment, the top of the fixed guide post surrounding the axial bore forming a fixed valve-sealing seat for the pilot valve the piston of which has a bottom with a resilient sealing member thereon for sealing contact with the seat, the fixed guide post having a bore extending through the upper portion thereof for pressure relief discharge of liquid through the guide post and pilot valve and into a tank, reservoir or the like when the pilot valve is lifted by the float into the open position.

5,067,517

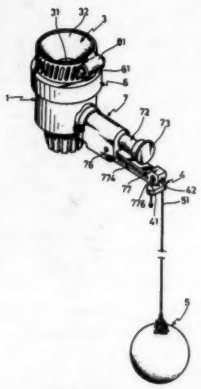
QUANTITATIVE LIQUID LEVEL CONTROLLING DEVICE

Liu Ting-Chih; Hsieh Sheng-Shun, and Huang Shih-Shiung, all of 9-2 Fl., No. 500, Lin Sen N. Road, Taipei, Taiwan

Filed Oct. 29, 1990, Ser. No. 605,661

Int. Cl.[5] F16K *31/24, 33/00*

U.S. Cl. 137—426 **6 Claims**



1. A quantitative liquid level controlling device, comprising:

a housing having a circular groove at the top, an outer thread on its outer wall, an outlet hole at the inside with an annular gasket fastened therein, and a through-hole transversely piercing through its outer wall at one side at a lower position with a rubber ring fastened therein;

a ball placed inside said housing and releasably stopped at said annular gasket to close said outlet hole;

a socket having a bottom flange mounted on the circular groove at the top of said housing, a concave surface portion disposed internally at the top with a center hole vertically piercing therethrough, a vertical retaining edge at the bottom of said concave surface portion for retaining a tap or pipe connector inserted therein, and at least a unitary reinforcing rib at a suitable location to reinforce its structure for holding said tap or pipe connector;

a ring connector having an inner thread screwed up with the outer thread of said housing with its ring-shaped topmost edge stopped at the top of the bottom flange of said socket to firmly secure said socket to said housing;

a holder plate fastened in the transverse through-hole of said housing and fixedly secured thereto having a driving rod transversely fastened therein, said driving rod having sleeved thereon a compression spring and a movable cap and longitudinally screwed up with a connecting rod at one end, and a control rod secured thereto by a locking pin disposed longitudinally in alignment therewith, said control rod having a raised portion at the top and a through-hole at the opposite end;

a locating element made of flexible resilient material, having two holes spaced from each other for fastening a cord through the through-hole of said control rod to secure said locating element to said control rod;

a gravity pendant secured to said cord at one end to pull said control rod downward by means of its gravity; and

wherein said gravity pendant pulls said control rod to move downward permitting the raised portion of said control rod to engage in the groove on said connecting rod so that said driving rod moves transversely through said through-hole into said housing at said outlet and pushes said ball away from said annular gasket permitting liquid from said tap to discharge through said outlet hole; said gravity pendant will float on the quantitative fluid, when the quantitative fluid level reaches a predetermined liquid

level that is determined by the selectively positioning of said gravity pendant, thereby permitting said control rod to disengage from the groove allowing said driving rod to move back to its original position solely by said compression spring so that said ball is returned to close the hole on said annular gasket and to completely stop the flow of liquid.

5,067,518

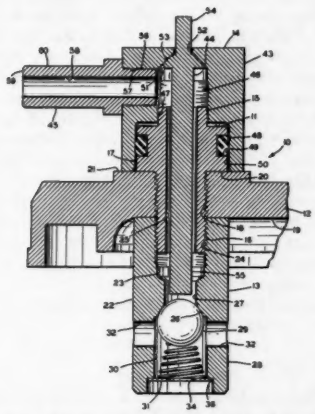
PRESSURE FEED PAINT CUP VALVE

Michael J. Kosmyna, Toledo, Ohio, assignor to Ransburg Corporation, Indianapolis, Ind.

Filed May 1, 1991, Ser. No. 694,437

Int. Cl.[5] F16K *15/18*

U.S. Cl. 137—588 **6 Claims**



1. A valve for securing to the lid for a pressure feed paint cup comprising an adapter secured to the paint cup lid, said adapter having a first threaded end located within the paint cup, a second threaded end located outside of the paint cup and a passage extending between said ends, a check valve assembly including a first body threaded onto said first adapter end, said first body defining an interior passage communicating with said adapter passage, a ball and spring retained within said first body passage, said spring urging said ball against a conical seat in said first body passage, a vent valve assembly including a second body threaded onto said second adapter end, said second body defining an interior passage communicating with said adapter passage, a valve stem having a spherical surface seated against a conical seat in said second body passage, means for supplying pressurized air through said second valve body passage, said adapter passage and through said first valve body passage to pressurize the paint cup, such air deflecting said spring to flow between said ball and said conical seat in said first body passage, and means for separating said spherical valve stem surface from said second body seat and for simultaneously separating said ball from said first body seat to vent pressure from the paint cup.

5,067,519

SAFETY VALVE FOR FLUID SYSTEMS

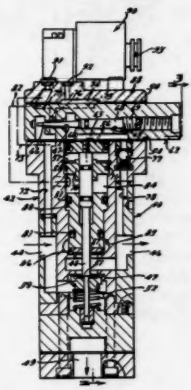
Neil E. Russell, Bloomfield Hills, Mich., and Owen H. Libby, Martin, Ga., assignors to Ross Operating Valve Company, Troy, Mich.

Filed Nov. 26, 1990, Ser. No. 617,579

Int. Cl.[5] F15B *13/04*

U.S. Cl. 137—596.14 **26 Claims**

1. In a fluid system having a fluid-operated device and a supply line for supplying pressurized fluid to said device at a predetermined line pressure, a safety valve interposed in said supply line, said safety valve comprising: a housing with supply, outlet, and exhaust ports in said housing; a movable poppet valve member carried by a valve stem for providing fluid communication between said supply and outlet ports when in an open position and for preventing said fluid communication when in a closed position, said line pressure tending to forcibly urge said poppet valve member to its closed position; a piston movable in a piston chamber in said housing and connected to said valve stem; first passage means in said housing leading from said supply port to said piston chamber; second passage means in said housing leading from said piston chamber to said outlet port; and restriction means for restricting fluid flow in said first passage means; the relative dimensions of said piston and said poppet valve member being such that said piston and said valve stem will shift said poppet valve member to its open position against the force of said line pressure when a predetermined proportion of said line pressure has been reached in said piston chamber; said safety valve also including an exhaust piston movable in an exhaust closure chamber within said



housing; an exhaust valve member connected to said exhaust piston and movable therewith between an open position providing fluid communication between said outlet and exhaust ports and a closed position preventing fluid communication therebetween; third passage means in said housing leading from said supply port to said exhaust closure chamber so that said line pressure can forcibly act on said exhaust piston and tend to urge said exhaust valve member to its closed position, operator means selectively actuable between at least two positions respectively permitting and cutting off flow of said line pressure to said piston chamber and to said exhaust closure chamber; and the relative dimensions of said exhaust piston and said exhaust valve member being such that said exhaust valve member will shift to its closed position when said line pressure is present in said exhaust closure chamber and such that said exhaust valve member will shift to its open position in order to exhaust said outlet port through said exhaust port when said line pressure is cut off from said exhaust closure chamber.

5,067,520

TAP FOR COMPRESSED OR LIQUEFIED GAS

Paul Kremer, Walferdange, and Leon Kerger, Helmdange, both of Luxembourg, assignors to Ceodeux S.A., Lintgen, Luxembourg

Filed Jan. 31, 1991, Ser. No. 648,580

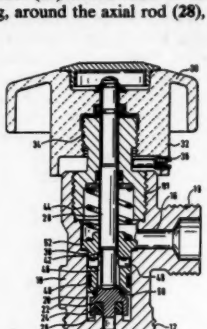
Claims priority, application Luxembourg, Jan. 31, 1990, 87671

Int. Cl.[5] F16K *11/18*

U.S. Cl. 137—614.2 **5 Claims**

1. Tap for compressed or liquefied gas, comprising a body **(10)** designed in order to be screwed onto a gas bottle and including a closure member **(22)** in a chamber **(20)** at the intersection of an axial inlet channel **(14)** and of a radial outlet

channel (16), an external operating wheel (30) connected via an axial rod (28) through the body of the tap to the closure member (22) in order to displace the latter between an open position and a closure position, as well as a valve intended to contain a specific residual pressure in the bottle through the action of a spring (44), characterised in that the said valve consists of an annular cylindrical piston (38) mounted in a leaktight manner in the said chamber (20) downstream of the closure member (22) and defining, around the axial rod (28), an annular cylin-



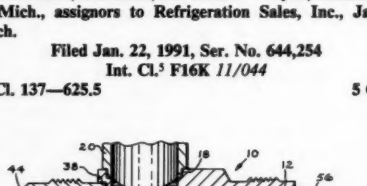
drical passage space (46) in communication, in an open position, with the outlet channel (16) via at least one radial orifice (48) in the said piston (38), in that a leaktight seal (50) is provided between the base of the said piston (38) and the head of the closure member (22), in that the said piston is stressed by a spring (44) in the direction of the closure member (22), and in that it comprises means for locking it in a position distant from the said closure member (22) against the action of its spring (44).

5,067,521

TWO-WAY REFRIGERATION VALVE WITH ELASTOMERIC SEAL

James K. Jenks, Clarklake, and Russell V. Lyke, Jackson, both of Mich., assignors to Refrigeration Sales, Inc., Jackson, Mich.

Filed Jan. 22, 1991, Ser. No. 644,254
Int. Cl.[5] F16K *11/044*
U.S. Cl. 137—625.5 **5 Claims**



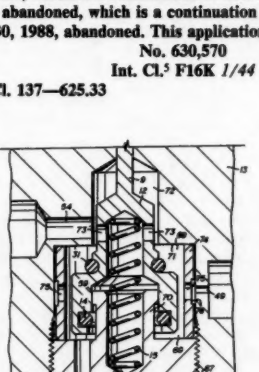
1. A two-way refrigeration valve comprising, in combination, a metal body having an axis, first and second ends and a central region, a chamber defined within said body central region, a threaded bore coaxially defined in said body second end intersecting said chamber, a metal adapter coaxially brazed to said body part first end having an exterior surface, conventional fitting attachment means defined on said adapter exterior surface, said adapter directly communicating with said chamber and partially defining said chamber, a first port defined in said adapter in communication with said chamber at a first location, a second port defined in said body central region in communication with said chamber at a second location spaced from said first location, a third port defined in said body in communication with said chamber at a third location spaced from said first and second locations, said chamber having an axis coaxial with said body axis, a first conical metal chamber sealing surface defined on said body concentrically related to said chamber axis, a second conical metal chamber sealing surface define don said adapter concentrically related to said chamber axis in axially spaced opposed relation to said first sealing surface, said sealing surfaces partially defining said chamber and converging in a direction away from each other, said first and third locations intersecting said first and second sealing surfaces, respectively, said second location intersecting said chamber intermediate said first and second sealing surfaces, a valve member having a threaded stem received within said body threaded bore, said valve member including a head located within said chamber linearly movable substantially parallel to said chamber axis upon rotation of said stem, said valve head including a central portion having a central general plane substantially perpendicular to said chamber axis, first and second metal sealing surfaces defined on said head on opposite sides of said plane in opposed relation to said first and second chamber sealing surfaces, respectively, whereby said first head sealing surface is adapted to selectively engage with said first chamber sealing surface at one axial position of said valve head and said second head sealing surface is adapted to selectively engage with said second chamber sealing surface at a second axial position of said valve head, and an annular elastomeric seal band circumscribing said valve head central portion and radially extending beyond said first and second valve head sealing surfaces and axially extending beyond the adjacent projection of said sealing surfaces adapted to selectively sealingly engage with said first and second chamber seal surfaces prior to engagement of said first chamber and valve head sealing surfaces and said second chamber and valve head sealing surfaces, respectively.

5,067,522

PRESSURE BALANCE VALVE SPINDLE

Jone Y. Ligh, P.O. Box 420509, Houston, Tex. 77242-0509

Continuation of Ser. No. 554,550, Jul. 19, 1990, Pat. No. 4,991,620, which is a continuation of Ser. No. 352,619, May 15, 1989, abandoned, which is a continuation of Ser. No. 213,928, Jun. 30, 1988, abandoned. This application Dec. 20, 1990, Ser. No. 630,570
Int. Cl.[5] F16K *1/44*
U.S. Cl. 137—625.33 **9 Claims**



1. A pressure balanced valve spindle comprising three axially aligned and connected cylindrical segments of decreasing diameter, the first and largest diameter segment defining a lower seating and guide chamber therein and having an internal annular groove to receive a first O-ring seal, the second segment defining a spring receptacle chamber therein and having a bore normal to and through said second segment and said spring receptacle chamber, the third and smallest diameter segment defining an actuator stem, and an external annular

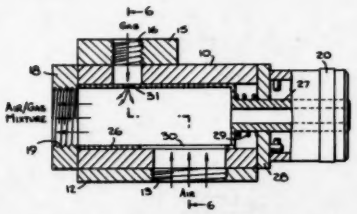
groove between said first and second segments to receive a second O-ring seal.

5,067,523

AIR-GAS CONTROLLER UNIT

Joseph Fraioli, 8 Seymour Pl., White Plains, N.Y. 10605

Filed Nov. 7, 1990, Ser. No. 610,072
Int. Cl.[5] F16K *11/076*
U.S. Cl. 137—625.41 8 Claims



1. A controller unit adapted to supply a combustible air-gas mixture to a gas-fired burner, said unit comprising:

(a) A valve body having a cylindrical cavity therein aligned with an air-gas mixture outlet at one end of the body, an air inlet being formed at one side of the body and a gas inlet being formed at another side of the body, said air inlet and said gas inlet communicating with said cavity at axially displaced positions; and

(b) a hollow cylinder functioning as a mixing chamber received in said cavity and turnable therein from a maximum to a minimum setting, one end of said cylinder being open and being in alignment with said outlet to discharge an air and gas mixture from said chamber into said outlet, said cylinder having an air orifice therein which at said maximum setting lies in registration with said air inlet whereby as the cylinder is turned from the maximum to the minimum setting, the air orifice proceeds to fall out of registration, said cylinder having a gas orifice therein whose dimensions are small relative to those of the air orifice to established a desired air-to-gas ratio and which at said maximum setting lies in registration with said gas inlet whereby as the cylinder is turned from the maximum to the minimum setting, the gas orifice proceeds to fall out of registration to the same degree as the air orifice, whereby as the cylinder is turned it acts to adjust the volumetric flow rate of air and gas admitted into the mixing chamber while maintaining the ratio therebetween.

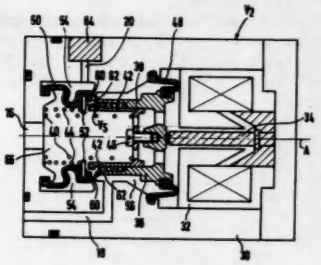
5,067,524

DIFFERENTIAL PRESSURE CONTROL VALVE

Josef Pickenhahn, Plaidt, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed Dec. 27, 1990, Ser. No. 634,559
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943003
Int. Cl.[5] F16K *31/10*
U.S. Cl. 137—627.5 6 Claims

1. A differential pressure control valve, comprising a valve housing (30) which has an inlet (20) for a fluid under relatively high pressure and at least one outlet (18) for the fluid and in which a plunger (36) is movable axially by an electromagnet (32) toward a valve seat (V_S) biased axially in the opposite direction by a first spring (44), characterized in that a second spring (42) causes the plunger (36) to enter into functional engagement with a stop (52) connected to the valve seat (V_S), while it is being moved toward the valve seat (V_S) but before



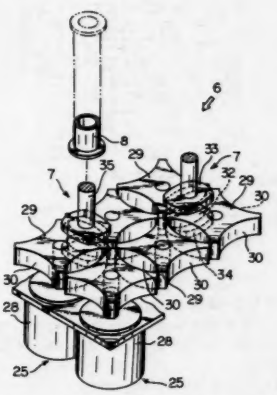
or as it touches the same, and in that the pressure of the first spring (44) is greater than of the second (42) one.

5,067,525

THREE-DIMENSIONAL FABRIC WOVEN BY INTERLACING THREADS WITH ROTOR DRIVEN CARRIERS

Makoto Tsuzuki; Masahiko Kimbara; Kenji Fukuta, and Akihiko Machii, all of Tsukuba, Japan, assignors to Three-D Composites Research Corporation, Tsukuba, Japan

Filed Dec. 28, 1989, Ser. No. 458,400
Claims priority, application Japan, Dec. 28, 1988, 63-335020; Dec. 28, 1988, 63-335022; Mar. 30, 1989, 1-79704; Apr. 4, 1989, 1-85111
Int. Cl.[5] D04C *1/00*
U.S. Cl. 139—11 10 Claims



6. In an apparatus for weaving a three-dimensional fabric by interlacing threads held by a large number of bobbin- or thread-carriers adapted to move about along predetermined paths within a traveling surface thereof, the improvement which comprises a carrier driver that moves the carriers, said carrier driver comprising:

a) a large number of drive units for driving in two directions and disposed in a carrier traveling surface;

b) the drive units carrying rotors that are turned by said drive units in $\pm 90°$ increments about their central axis in the carrier traveling surface, the rotors being disposed contiguous to one another in the carrier traveling surface;

c) each rotor having a plurality of recesses adapted to hold a carrier between a pair of adjoining rotors;

d) the carrier, having a grip, said grip being formed by two arched surfaces centered on the rotating axes of adjoining rotors to fit between the recesses thereof; and

e) the recesses on the rotor being shaped so that when one of the paired adjoining rotors turns while holding the carrier the recesses on the other rotor serve as a guide to help a transfer of the carrier;

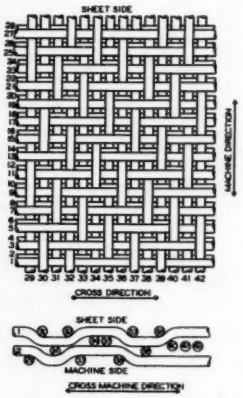
such that when one of the rotors holding the carrier turns to move the carrier, over the recesses on the other rotor serving as a transfer guide, the desired three-dimensional fabric is woven by way of a repetition of this cycle with many rotors.

5,067,526

14 HARNESS DUAL LAYER PAPERMAKING FABRIC

Samuel H. Herring, Tallahassee, Fla., assignor to Niagara Lockport Industries, Inc., Quincy, Fla.

Filed Aug. 6, 1990, Ser. No. 562,728
Int. Cl.[5] D03D *13/00*
U.S. Cl. 139—383 A **10 Claims**



1. A fabric for use on a papermaking machine, comprising

a dual layer, fourteen harness woven fabric having an upper, or sheet, side and a lower, or machine, side and further comprising

a set of machine direction yarns;

a first set of cross machine direction yarns forming knuckles with said machine direction yarns and extending mainly on said sheet side and interlaced with said set of machine direction yarns such that each sheet side knuckle of said machine direction yarns floats over two of the sheet side cross machine direction yarns;

a second set of cross machine direction yarns extending mainly on said machine side and interlaced with said set of machine direction yarns;

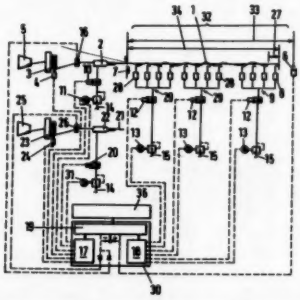
said interlacing of said machine direction yarns and said cross machine direction yarns including at least one said machine direction yarn interposed between each lowermost portion of each said sheet side cross machine direction yarn and any subjacent said machine side cross machine direction yarns, whereby overlap of adjacent cross machine direction yarns of said machine side set and said sheet side set is substantially avoided.

5,067,527

ADJUSTMENT OF WEFT YARN STRETCH IN A SHED OF AN AIR JET LOOM

Godert de Jager, Uster, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 27, 1990, Ser. No. 559,171
Claims priority, application Switzerland, Sep. 1, 1989, 3183/89
Int. Cl.[5] D03D *47/30*
U.S. Cl. 139—435.2 **20 Claims**



1. A method of adjusting weft yarn stretching in a shed of an air jet loom having at least one main blowing nozzle and a plurality of groups of relay nozzles disposed across a shed, said method comprising the steps of

detecting the arrival of a picked weft yarn at a first weft stop motion at an end of the shed and emitting a first signal in response thereto;

detecting a stop shock in the picked weft in a second stop motion upstream of the shed or a similar signal that the accumulated predetermined length of weft has been drawn off the accumulator and emitting a second signal in response thereto; and

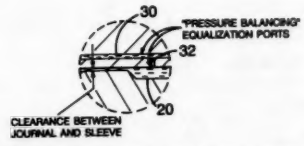
measuring the time difference between said signals and using said measured time difference as a parameter for the stretching of the weft yarn in the shed and as a parameter for controlling at least the relay nozzles in the picking of a weft yarn in the shed.

5,067,528

HYDRODYNAMIC BEARING

Forrest Titcomb; Jackie Cordova, both of Colorado Springs, Colo., and Max W. Schaule, Mindelheim, Fed. Rep. of Germany, assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 382,251, Jul. 19, 1989. This application Nov. 21, 1989, Ser. No. 439,884
Int. Cl.[5] B65B *31/00*
U.S. Cl. 141—4 **3 Claims**



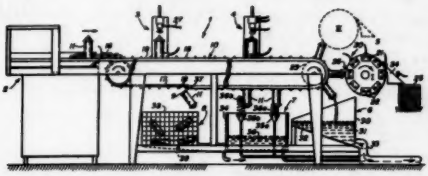
1. A method for introducing liquid lubricant into a hydrodynamic bearing having clearance spaces for filling with a liquid lubricant comprising:

placing the bearing in a vacuum chamber above a liquid lubricant;

evacuating the chamber to a pressure below atmospheric pressure;

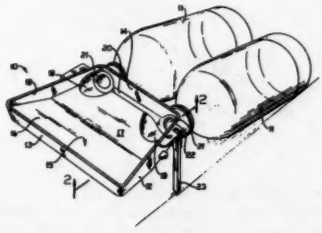
submerging the bearing into the lubricant;
raising the pressure in the chamber to atmospheric pressure; and
exposing the filled bearing to ultrasonic energy.

5,067,529
AEROSOL CAN RECYCLING APPARATUS AND METHODS
Walter E. Gonzalez-Miller, Campbell, and Jacques M. Dulin, Cupertino, both of Calif., assignors to Depressurized Technologies International, Inc., San Jose, Calif.
Filed Oct. 30, 1989, Ser. No. 429,852
Int. Cl.[5] B65B *31/00*; B67B *7/24*
U.S. Cl. 141—7 **19 Claims**



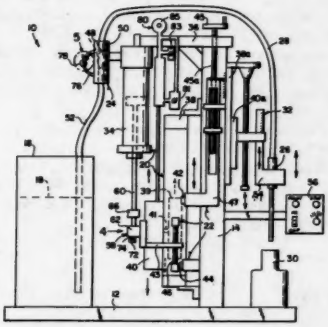
1. Aerosol can reclamation method for non-destructively disassembling spent, mis-filled or surplus propellant-pressurized aerosol cans having gas and chemical contents and collection of the can contents and can parts, which aerosol can is of the type having a can body with a can bottom, a top cap with a central actuator stem joined to a cap rim by a generally planar intermediate annular member at the base of said stem, which top cap rim is crimp-sealed to a rim of an opening at one end of the body of said can, comprising in any operative sequence the steps of:
a) isolating at least a portion of one end of said can to confine gases released therefrom in a first zone from unrestricted release to the atmosphere;
b) piercing said isolated can end to release can propellant gas into said confined zone;
c) decrimping said can top cap to at least partially break said seal between said can top cap and said rim;
d) removing said can top cap from said rim without substantial damage to said can body; and
e) recovering said can body for recycle.

5,067,530
WASTE OIL COLLECTION AND DISPOSAL SYSTEM
Edward H. Short, III, Tulsa, Okla., assignor to Allied Plastics, Inc., Gastonia, N.C.
Filed Nov. 28, 1990, Ser. No. 619,138
Int. Cl.[5] B65B *1/04*
U.S. Cl. 141—98 **4 Claims**



1. A waste oil collector adapted to be placed under the oil pan of a vehicle to catch used oil drained form the engine characterized in that the waste oil is directed into at least one bottle for collection and disposal, said collector comprising a catch pan that is generally rectangular in shape adapted to be placed under the oil pan of an engine for collecting oil that is drained form the engine, said catch pan comprising end, side and bottom walls defining an initial oil collection chamber therein, said bottom wall being inclined to the horizontal so that the oil flows to one end of the pan, said end wall at said one end of said pan having at least one aperture, at least one bottle for receiving and collecting waste oil for disposal extending outwardly at an incline to the horizontal from said aperture, releasable engagement means operatively associated with the aperture in the end wall for connecting the outwardly extending bottle to said end wall to receive waste oil exiting through said aperture, and leg means extending downwardly from said catch pan adjacent said end wall for supporting said catch pan in a cantilever manner and at a sufficient elevation that the oil can drain into the inclined bottle, said bottle in the inclined position thereof serving as a counterbalance for supporting said catch pan in said cantilever manner from said leg means.

5,067,531
BENCH TOP CONTAINER FILLER
Kenneth Herzog, 200 Mill Rd., Riverhead, N.Y. 11901
Filed Oct. 30, 1989, Ser. No. 429,047
Int. Cl.[5] B65B *3/32*
U.S. Cl. 141—116 **8 Claims**



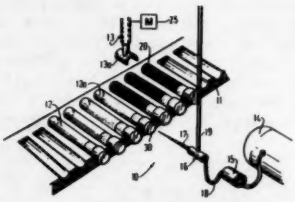
1. A bench top volumetric container filler which comprises:
a) a reservoir of fluid;
b) pumping means mounted on a stanchion for pumping the fluid out of said reservoir; including a driving piston rod;
c) means for controlling volume of the fluid pumped, responsive to movement of said rod to control said rod movement;
d) means for preventing backflow of the fluid into said reservoir;
e) a filling nozzle fluidly connected to said backflow preventing means;
f) a container for receiving the fluid from said filling nozzle;
g) means for controlling height of said filling nozzle to compensate for varying heights of said container;
h) means for fine tuning volume of fluid dispensed by said pumping means wherein said piston rod movement is adjustable in addition to the first said means for controlling volume of fluid pumped;
i) a means of controlling aspirating and discharging speeds of said pumping means by a controller piston mounted in a chamber having fluid means for controlling pressures on said controller piston during aspirating and discharge movement; said controller piston being connected and parallel to said driving piston rod wherein said pumping means further includes:
j) a volumetric piston pump with a driven piston rod extending therefrom; and
k) a pump driving cylinder with a slide mount connecting to said driving piston rod and said driven piston rod by an adjustment block coacting with said fine tuning means.

5,067,532

APPARATUS FOR FILLING SELF-SEALING TUBES

John Lang, Shannon, County Sligo, and Cormac Garvey, Boltown Hall, Kilskyre, Kells, County Meath, both of Ireland

Filed Feb. 20, 1990, Ser. No. 481,185
Claims priority, application Ireland, Feb. 20, 1989, 2548/88
Int. Cl.[5] G01N *1/14*
U.S. Cl. 141—329 24 Claims



1. An apparatus for introducing a fluid into a tube having a self-sealing closure means, said apparatus comprising:

a base;

clamping means having a substantially hemi-tubular construction for releasably clamping the tube against the base at a fluid injecting station and for releasably maintaining the tube in a substantially horizontal position;

injector means including a first hollow injector needle selectively engageable with said closure means;

means for enabling the needle to penetrate the closure means thereby introducing a charge of liquid into the tube and for enabling the needle to be withdrawn from the tube; and

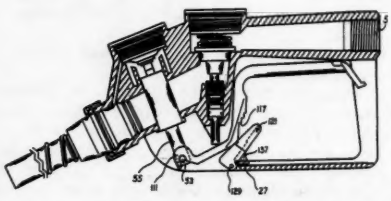
means for raising and lowering the clamping means relative to the tube so that in a first position of use, the clamping means is in engagement with the tube so as to bias the tube gently but firmly downwards against the base and in a second position of use the clamping means is out of engagement with the tube.

5,067,533

CAST NOZZLE HAVING IMPROVED LATCH AND SHUT-OFF MECHANISM

Mervin L. Carder, Sr., 78 May Valley La., and E. Leonard Poli, 1375 Greenbirch Ct., both of Fenton, Mo. 63026

Continuation of Ser. No. 391,137, Aug. 8, 1989, abandoned. This application Mar. 18, 1991, Ser. No. 673,154
Int. Cl.[5] B67D *5/371*
U.S. Cl. 141—392 12 Claims



1. In a liquid dispensing nozzle comprising a casing having an inlet, an outlet spout, a fluid passage therebetween, and a valve seat in the fluid passage; a poppet valve cooperative with the valve seat for closing the fluid passage; biasing means for biasing the poppet valve to a closed position; a valve stem depending from the poppet valve; a manually operable lever cooperative with the valve stem for opening the poppet valve against the bias of the biasing means, the lever being formed in an "S" shape; a hand guard extending below and around the manually operable lever; an automatic shut-off means forming a pivot for the lever, the shut-off means including a plunger moveable to an extended position for disabling the manually operable lever from opening the poppet valve when the outlet spout is immersed in liquid and spring means for returning the plunger to a retracted position; the lever including a forward arm pivoted to the plunger of the automatic shut-off means and also engaging the valve stem of the poppet valve, an intermediate portion, and a rearward hand-hold; and a clip for holding the lever in a raised position for holding the poppet valve open, the improvement wherein

the hand guard includes a central horizontal portion and a ledge spaced slightly above the horizontal portion,

the lever and the clip are formed in a mold by molding or casting,

the clip is rotatably mounted on the hand guard behind and below the intermediate portion of the lever, the clip and lever being rotatable in a common plane,

the nozzle further comprising

a spine on a lower surface of the intermediate portion of the lever, the spring having a width less than the width of the intermediate portion,

a plurality of serrations on the spine, the clip being rotatable into selective engagement with one of the serrations,

a return spring for biasing the clip out of engagement with the lever, one end of the return spring extending under the ledge on the hand guard,

the clip having a width substantially equal to the width of the intermediate portion,

the clip including a rear wall and two side walls surrounding the spine in said engaged position of the clip,

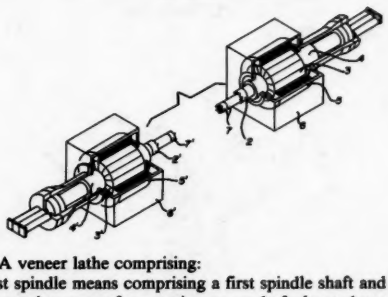
the clip further comprising stop means engaging the ledge when the clip is in its rest position for limiting rotation of the clip to a rest position closely adjacent the lever, with the rear wall of the clip substantially parallel to the intermediate portion of the lever and the rear wall and side walls of the clip surrounding the spine when the lever is released and the plunger returned to its retracted position, the rest position of the clip permitting the clip to be easily rotated to said engaged position by one hand of a user holding the lever.

5,067,534

SPINDLE DRIVE FOR A VENEER LATHE

Juha Toivio, Lahti, Finland, assignor to Raute Oy, Lahti, Finland

PCT No. PCT/FI89/00065, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO89/12535, PCT Pub. Date Dec. 28, 1989
PCT Filed Apr. 10, 1989, Ser. No. 601,699
Claims priority, application Finland, Jun. 20, 1988, 882937
Int. Cl.[5] B27L *5/02*
U.S. Cl. 144—209 R 5 Claims



1. A veneer lathe comprising:

first spindle means comprising a first spindle shaft and first grasping means for grasping one end of a log to be turned about a longitudinal axis of said lathe, said first spindle means being displaceable along said longitudinal axis to grasp said log;

second spindle means disposed opposite to said first spindle means along said longitudinal axis, said second spindle means comprising a second spindle shaft and second

grasping means for grasping another end of said log opposite said one end, said second spindle means being displaceable along said longitudinal axis to grasp said log;

drive means for rotating at least one of said first or second spindle means about said longitudinal axis, said drive means comprising rotor means mounted on at least one of said first or second spindle shafts and stator means disposed in a frame around said rotor means.

5,067,535

WORKTABLE

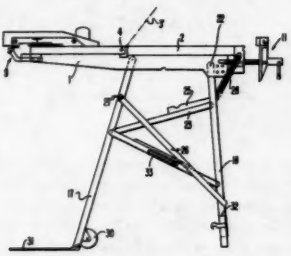
Robert Wolff, Engeln, Fed. Rep. of Germany, assignor to Werkzeug-gesellschaft mit beschranter Haftung, Weilbern, Fed. Rep. of Germany

Filed Apr. 4, 1990, Ser. No. 503,982

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 3910826

Int. Cl.[5] B25H *1/00*

U.S. Cl. 144—286 R 15 Claims



1. A worktable comprising:

a table top frame;

a workbench panel mounted on the frame adjacent to a first end of the frame;

a tool mounting panel pivotably mounted on the frame adjacent to a second end of the frame such that the tool mounting panel is positionable in an inclined position above the workbench panel;

a first pair of legs attached to a first side of the frame and a second pair of legs attached to a second side of the frame;

a first connecting member connecting the legs of the first pair of legs to each other and a second connecting member connecting the legs of the second pair of legs to each other, said legs being pivotably attached to the frame and the first and second connecting members are pivotably attached to the legs such that the legs are foldable towards the second end of the frame;

a tool mounting area provided on the tool mounting panel, said legs being foldable beneath the tool mounting panel without obstructing the tool mounting area; and

spring means attached to the frame and to the legs for holding the legs in an unfolded position when the legs are unfolded from a folded position beneath the tool mounting panel past a dead center position to the unfolded position, and for holding the legs in the folded position when the legs are folded from the unfolded position past the dead center position to the folded position.

5,067,536

METHOD FOR MAKING STRUCTURAL PRODUCTS FROM LONG, THIN, NARROW, GREEN WOOD STRANDS

Frank T. Liska, and Frank F. Liska, both of 1403 - 1770 Davie Street, Vancouver, British Columbia V6G 1W4, Canada

Filed Feb. 7, 1990, Ser. No. 476,077

Int. Cl.[5] B27M *1/02*

U.S. Cl. 144—361 8 Claims

1. A process for producing a high quality agglomerated structural member from engineered long, thin, narrow, green wood strands having a longitudinal axis, said strands remaining parallel to each other throughout the process, the process comprising:

feeding the strands from a strand producing machine onto a transfer conveyor with an orientation whereby the longitudinal axes of the strands is transverse to the direction of motion of the strands;

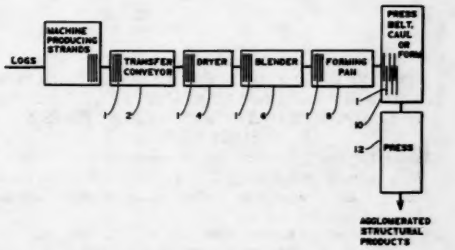
feeding said strands into a screen dryer while maintaining said orientation;

confining said strands in the said dryer between a bottom screen belt and a top screen belt while maintaining said orientation, said screen belts preventing intermingling and breaking of said strands while allowing said strands to shrink in all directions during the drying process;

subjecting the strands in the dryer to a drying medium that penetrates through said screen belts while maintaining said orientation and transporting said screen belts and said strands confined between them at identical speed through the dryer;

feeding said strands into a cooling section of said dryer while maintaining said orientation;

confining said strands in said cooling section between a bottom screen belt and a top screen belt while maintaining said orientation, said screen belts preventing intermingling and breaking of said strands;



subjecting said strands in the cooling section to cooling air that penetrates through said screen belts while transporting said screen belts, with said strands confined between them and maintained in said orientation, at identical speed through the cooling section;

feeding said strands into a blender while maintaining said orientation, said blender comprising a set of carrying screens cascading downwardly and vibrating in the direction of motion of said strands;

spraying said strands with resin in said blender;

discharging said strands onto a vibrating forming pan while maintaining said orientation, said pan vibrating in the direction of motion of the strands and declining slightly in the direction of said motion, said pan simultaneously moving slowly forward and backward in said direction of motion a predetermined distance;

transferring said strands onto a moving receiving member to spread said strands over a predetermined width to form a mat on said receiving member of a width equal to the predetermined distance formed by backward and forward movement of the forming pan, said receiving member moving back and forth in a direction parallel to the longitudinal axes of the strands to enable forming of a mat of strands that overlap longitudinally with each other; and

transferring said mat of strands into a heated press and compressing the mat, covered with resin, to produce the structural member.

5,067,537

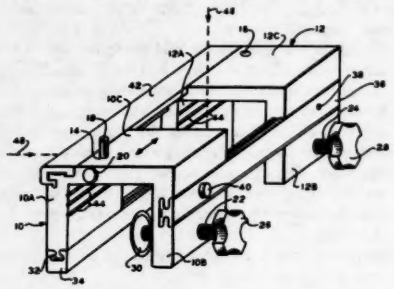
FIXTURE FOR HINGE MORTISE

Dennis Offner, Lake Iosco, Haskell, N.J. 07420

Filed Nov. 3, 1989, Ser. No. 431,074

Int. Cl.[5] B27M *3/00*

U.S. Cl. 144—372 **29 Claims**



1. A fixture for cutting a mortise for a hinge or strike plate in a workpiece comprising:

a pair of spaced saddles;

at least one bar connected between said pair of saddles, at least one of said saddles being slideably mounted on said bar;

a pair of clamp means, each being mounted in a different corresponding one of said saddles to clamp said workpiece; and

a removeable guide detachably mounted between said saddles.

5,067,538

DIMENSIONALLY STABLE POLYESTER YARN FOR HIGHLY DIMENSIONALLY STABLE TREATED CORDS AND COMPOSITE MATERIALS SUCH AS TIRES MADE THEREFROM

Charles J. Nelson, Chesterfield; Jayendra H. Bheda; Peter B. Rim, both of Midlothian, all of Va., and James M. Turner, Cary, N.C., assignors to Allied-Signal, Morris Township, Morris County, N.J.

Filed Oct. 28, 1988, Ser. No. 263,756

Int. Cl.[5] D02G *3/48*; B60C *9/00*

U.S. Cl. 152—451 **10 Claims**

1. A drawn polyethylene terephthalate multifilament yarn having the following combination of properties:

(A) a terminal modulus of at least 20 g/d,

(B) a dimensional stability defined by the sum of elongation at 4.5 g/d load and free shrinkage after 1 minute in 177° C. dry air of less than 11.5%,

(C) a tenacity of at least 5 grams/denier,

(D) a melting point elevation of 14° to 22° C., and

(E) an amorphous orientation function of less than 0.75.

5,067,539

METHOD FOR CORRECTING TYPE DEFLECTION IN TIRE GROOVING AND APPARATUS THEREFOR

Satoru Kinuhata; Masao Takami, both of Kobe; Eiji Shibata, Nakama, and Tadahiko Tamura, Kitakyushu, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Division of Ser. No. 432,405, Nov. 6, 1989, which is a continuation-in-part of Ser. No. 285,557, Dec. 16, 1988, abandoned. This application Aug. 24, 1990, Ser. No. 572,278

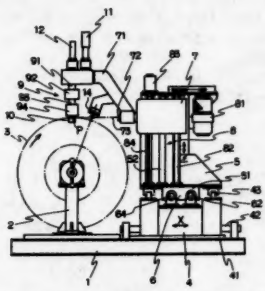
Claims priority, application Japan, Dec. 19, 1987, 62-322207; May 30, 1988, 63-134026; May 30, 1988, 63-134027

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] B29D *30/68*

U.S. Cl. 157—13 **3 Claims**

1. A method for compensating radial deflection and lateral deflection of a tyre in tyre tread grooving wherein a cutter movement is controlled by a plurality of operating shafts including a radially driving shaft, which moves a cutter in a direction along the diameter of the tyre, and a laterally driving shaft, which moves the cutter in a direction along the width of the tyre, and desired pattern grooves are formed in the tyre tread surface, characterized by the steps comprising supporting a tyre to be tread grooved on a supporting shaft, while rotating said supported tyre on said supporting shaft, detecting radial deflection of said supported tyre in a direction along the diameter of said supported tyre before or during tyre tread grooving and detecting lateral deflection in a direction along the width of said supported tyre before or during tyre tread



grooving, and grooving the tread of said rotating supported tyre with a cutter moved relative to said tyre tread in accordance with a main program based on a prespecified grooving pattern while concurrently adjusting radial movement and lateral movement of the cutter in accordance with a correction program based on detected radial and lateral deflections in order to follow the radial deflection and the lateral deflection, wherein the cutter movement is provided by mechanically superposing reference movement and correction movement, which are respectively calculated by the main program and the correction program and are separately generated as mechanical movements.

5,067,540

COMBINATION WINDOW FRAME WITH ROLL-UP SHUTTER CHANNELS MOUNTED ON IT AND ASSOCIATED SHUTTER HOUSING

Armin Besler, Kuhlehof 16, D-4630 Bochum, Fed. Rep. of Germany

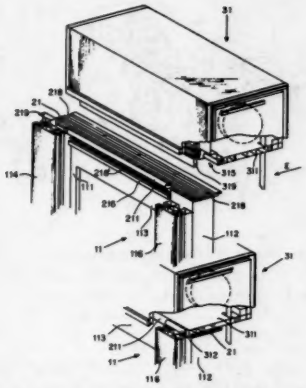
Filed Oct. 5, 1987, Ser. No. 105,596

Int. Cl.[5] A47H *1/00*

U.S. Cl. 160—31 **11 Claims**

1. A combination window frame with a top frame member and spaced parallel frame members, a pair of roll-up shutter channels which are mounted on respective said side frame members and an associated shutter housing, further comprising front connectors on said top frame member of said window frame and extending between the shutter channels; said front connectors being spaced from said shutter channels; said shutter housing having a shutter-housing base plate; first coupling means on said base plate; said top frame member having a flat adapter extending over the length thereof and projecting forward and backward beyond said member, said adapter being bent out in a vicinity of the shutter channels and having longitudinal edges in the form of matching connectors that match said front connectors so that at least said front connectors and

said matching connectors engage with each other; second coupling means on said adapter for engaging said first coupling



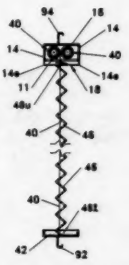
means on said base plate, whereby said adapter mounts said shutter housing to said window frame.

5,067,541

COLLAPSIBLE SUN SHADE AND METHOD FOR SHIELDING THE SUN

Fred L. Coslett, 4227 Boca Pointe Dr., Sarasota, Fla. 34238

Filed May 7, 1990, Ser. No. 519,960
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 **11 Claims**



1. A collapsible sun shade comprising:

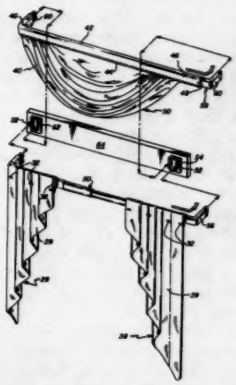
a generally hollow housing; at least one support means contained in and bound to said hollow housing for rotatably supporting a coiled spring plate; a plate member; a serrated shielding means for shielding the sun and including a plurality of pleated blades consecutively adjoined together to provide a serrated shape with a lower extreme blade defining a lower blade and an upper extreme blade defining an upper blade and with each of said plural blades having a structure defining an aperture, said upper blade contained in and coupled to said hollow housing and said lower blade secured to said plate member; at least one coiled spring plate having an upper end section and a lower end section and normally resiliently wound on a spindle member rotatably mounted to said support means and in said hollow housing, said upper end section of said coiled spring plate securing to said spindle member and said lower end section of said coiled spring plate comprising to said plate member and said coiled spring plate passing through all of said apertures of said blades; said hollow housing having a pair of opposed sides with a pair of lower side edges, a back bound to the opposed sides, and a generally open front wherethrough said serrated shielding means retractably passes, a partition member secured to the opposed sides and having a structure defining a guide aperture for guiding and receiving therethrough a structure of the coiled spring plate, a pair of ends connected to ends of the sides and the back such that the hollow housing essentially forms a rectangular box with the partition member forming a floor whereto the upper blade is coupled and the open front providing a longitudinal opening that is defined by the distance between the lower side edges and between the pair of ends; said at least one support means comprises a first pair of support members disposed between the partition and the back and secured to the back of the hollow housing; said at least one coiled spring plate comprising a first spindle member rotatably secured to said first pair of support members and a first coiled spring plate secured to the first spindle member; said at least one support means additionally comprises a second pair of support members disposed between the partition and the back and secured to the back of the hollow housing; and said at least one coiled spring plate additionally comprising a second spindle member rotatably secured to said second pair of support members and a second coiled spring plate secured to said second spindle members.

5,067,542

READY-MADE SWAG AND JABOT CURTAIN SYSTEM

Madlyn Easley, West Hartford, Conn., assignor to Intrascapes, Ltd., West Hartford, Conn.

Continuation of Ser. No. 3,547, Jan. 15, 1987, abandoned. This application Apr. 26, 1991, Ser. No. 692,829
Int. Cl.[5] A47H *1/00*
U.S. Cl. 160—126 **14 Claims**



1. A curtain system comprising: a pair of parallel curtain rods, one mounted behind the other and in substantially the same horizontal plane; a pair of jabots mounted on the forward rod; and a swag mounted on the rearward rod, said swag including a panel which is draped over said forward rod to hang in front of the upper portions of said jabots, each of said jabots including a panel that is folded upon itself and secured in that condition to provide a multiplicity of permanent pleats extending lengthwise thereof, and a strip piece fastened against the back surface of said folded panel and joined along the top edge thereof and also at a level spaced downwardly therefrom to provide a laterally extending pocket through which said forward rod is received, said pleats extending at least substantially to the upper edge of said forward rod, and said swag further including a sleeve piece on said panel thereof providing an elongated laterally extending pocket through which said rearward rod is received.

5,067,543

FOLDABLE DISPLAY SYSTEM WITH CONTINUOUS DISPLAY SURFACE

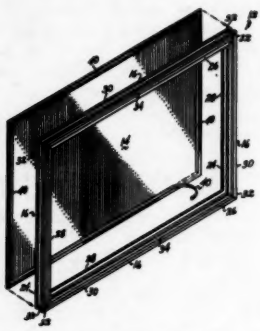
Thomas A. Bove, 1154 Herschel Ave., Cincinnati, Ohio 45208

Continuation of Ser. No. 406,369, Sep. 12, 1989, Pat. No. 4,958,671. This application Sep. 25, 1990, Ser. No. 587,991

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] A47G *5/00*

U.S. Cl. 160—135 **3 Claims**



1. A portable display system comprising:

a plurality of rectangular display panels having front and rear surfaces;

a plurality of rectangular panel support frames defining an array thereof, each frame having inner and outer edges and front and rear surfaces;

one of said display panel rear surface and said panel support frame front surface including means defining at least one channel, and the other of said display panel rear surface and said panel support frame front surface including locating means adapted to seat in said channel, said locating means and said channels cooperating such that the peripheral edges of each said panel and the outer edges of each said frame are in aligned registration with each other;

means hingedly joining adjacent panel support frames along their vertical abutting edges when said support frames are arranged in side-by-side relation to enable said array of frames to be selectively configured between a folded, portable position and an unfolded, display position;

means releasably securing each said display panel to a panel support frame with the peripheral edges of said panel and the outer edges of said frame being in aligned registration with each other so as to provide a substantially continuous and unbroken display surface when said array of support frames is in an unfolded, display position;

said securing means including a first member located on said support frame and a second member on said display panel rear surface, said first and second members cooperating to secure each said panel to a support frame.

5,067,544

WORM DRIVE FOR SETTING THE ANGULAR POSITION OF VERTICAL LAMELLA BLINDS

Horst Spohr, Cuxhaven, and Walter Huegin, Efringen-Kirchen, both of Fed. Rep. of Germany, assignors to bautex Adolf Stoever Soehne KG, Fed. Rep. of Germany

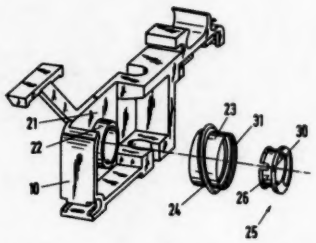
Filed Jul. 28, 1989, Ser. No. 387,167

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825978

Int. Cl.[5] E06B *9/38*

U.S. Cl. 160—177 **15 Claims**

1. A worm drive for setting the angular position of vertical slat blinds comprising means defining a vertical axis arranged inside a slat carrier housing, said means defining said vertical axis carrying a pinion torsionally connected thereto and having an end side joined to a slat, whereby a worm turnable by way of an inside profiling is in drive engagement with the pinion,



characterized in that the worm comprises an axial center opening and is held on a connection-piece-shaped projection of the slat carrier housing with a snap-on sleeve.

5,067,545

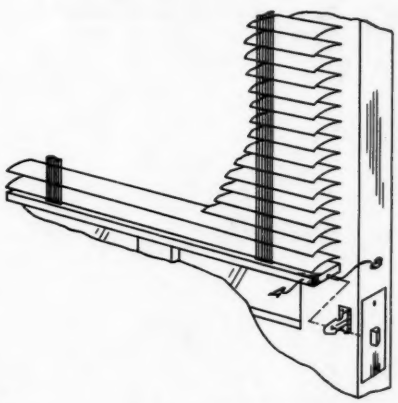
MINI BLIND HOLD DOWN BRACKET

Bruce G. Wilkins, 11702 Braewick, and Randolf E. Helm, 3308 Fountain View, #19, both of Houston, Tex. 77035

Filed Feb. 15, 1990, Ser. No. 480,651

Int. Cl.[5] E06B *9/30*

U.S. Cl. 160—178.1 **3 Claims**



1. The combination of a miniblind and a bracket to secure said miniblind to a support structure comprising:

said miniblind having a bottom rail projecting laterally from each side of said miniblind and being disposed near the bottom thereof,

said bracket having a base bracket halve and a securing bracket halve, said halves being connected by a hinge,

said base halve having holes for mounting said base halve onto said support structure,

said securing halve having a circular shaped, outwardly raised flange capable of securing thereto said bottom rail,

said halves held in resilient relation to each other so that said securing halve folds flat against said base halve when not securing said bottom rail,

said securing halve having an outside surface and an inside surface, said inside surface being that surface which contacts said base bracket when said securing halve is not securing said bottom rail, said circular shaped flange being located on said inside surface,

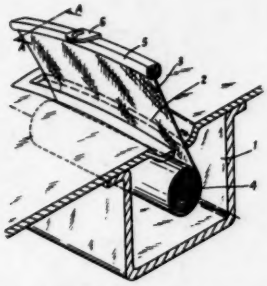
and a resilient means secured to said inside surface of said securing halve and secured to said base halve for holding said halves in said resilient relation to each other.

5,067,546

ROLLER BLIND FOR A MOTOR VEHICLE AND PROCESS FOR THE PRODUCTION THEREOF

Jean-Marie Jeuffray, and Ouvrard Gaston, both of Bressuire, France, assignors to ETS Farnier & Penin, Bressuire, France

Filed Apr. 17, 1990, Ser. No. 509,815
Claims priority, application France, Apr. 19, 1989, 89 05204
Int. Cl.[5] E06B 9/08
U.S. Cl. 160—23.1 6 Claims



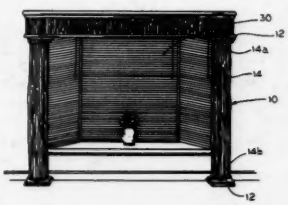
1. A roller blind suitable for substantially covering a curved motor vehicle window, comprising a housing have a guide slot, a straight roller member rotatably disposed within the housing, a single strip of flexible material of dimensions suitable for substantially covering a curved window of a motor vehicle and having a first end fixed to the roller member and a second end extending to the exterior of the housing through the slot, and a pull bar fixed to the second end of the strip, the guide slot and the pull bar being of curved configuration with substantially identical curvatures, and catch means attached to the pull bar at an angle with the strip end adjacent to the pull bar.

5,067,547

FABRIC COLUMN KIT AND SYSTEM

Wayne Movrich, LaGrange, Ill., assignor to Rich Ideas, Inc., LaGrange, Ill.

Filed Sep. 10, 1990, Ser. No. 579,736
Int. Cl.[5] E06B 9/00
U.S. Cl. 160—327 19 Claims



1. A fabric column system, comprising:
a pair of fabric supports each adapted for selected positioning in spaced apart relation;
means for fixedly mounting said fabric supports to a rigid surface in selected positions;
a fabric having opposite ends adapted for positioning adjacent respective ones of said fabric supports; and
means for releasably securing said opposite ends of said fabric to said respective ones of said fabric supports;
said releasable securing means including a rod pocket ring for said fabric, said fabric supports each including a base plate and a hold down plate and said rings being adapted to fit through rod pockets at said opposite ends of said fabric, and including means for securing said hold down plates to said base plates with said rings therebetween.

5,067,548

METHOD OF FORMING A CERAMIC MOLD FOR METAL CASTING

Stuart Z. Uram, Alpine, N.J., assignor to Certech Incorporated, Wood-Ridge, N.J.

Filed Mar. 19, 1991, Ser. No. 671,341
Int. Cl.[5] B22C 9/02, 9/12
U.S. Cl. 164—15 14 Claims

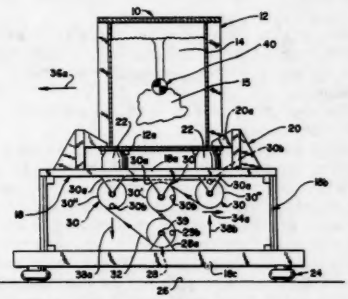
1. A method of forming a ceramic mold for metal casting, comprising the steps of:
(A) injection molding individual green mold sections from a slurry of ceramic particles and a binder;
(B) firing each of the individual green mold sections at a relatively low temperature for an extended period of time to remove therefrom a major portion of the binder while leaving therein a minor portion of the binder sufficient to afford structural strength thereto, and assembling the individual mold sections together to form a mold; and
(C) firing the mold at a high temperature to complete removal of the binder.

5,067,549

COMPACTION APPARATUS AND PROCESS FOR COMPACTING SAND

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Dec. 4, 1989, Ser. No. 445,468
Int. Cl.[5] B22C 15/10
U.S. Cl. 164—39 27 Claims



1. A compaction apparatus, comprising:
a flask adapted to contain sand and a pattern;
means for resiliently supporting said flask in a controlled orientation; and
means for imparting vibrational forces to said flask, said vibrational forces having horizontal force components causing generally horizontal oscillating movement of said flask and alternating oppositely directed vertical force components maintaining said flask in said controlled orientation during said generally horizontal oscillating movement thereof, said vertical force components establishing an alternating vertical force couple adapted to counteract rotational inertia of said flask.

21. A process for compacting sand around a pattern in a flask, comprising the steps of:
resiliently supporting said flask in a controlled orientation; and
imparting vibrational forces to said flask having horizontal and vertical force components, said horizontal force components causing generally horizontal oscillating movement of said flask, said vertical force components compris-

ing alternating oppositely directed vertical force components for maintaining said flask in said controlled orientation during said generally horizontal oscillating movement thereof, said vertical force components establishing an alternating vertical force couple adapted to counteract rotational inertia of said flask.

5,067,550

MANUFACTURING METHOD FOR DEFECT-FREE CASTING PRODUCT

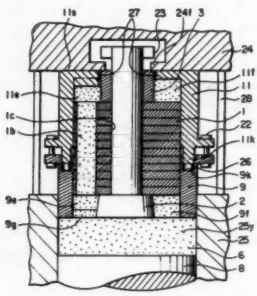
Shigeki Maekawa; Mikio Yamashita; Kenji Kawaguchi, and Yuji Kobayashi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,291

Claims priority, application Japan, Mar. 6, 1989, 1-54405; Nov. 14, 1989, 1-296828; Nov. 14, 1989, 1-296829

Int. Cl.[5] B22D *27/11*

U.S. Cl. 164—120 **26 Claims**



1. A method of manufacturing a defect-free cast product comprising the steps of:

forming a cavity surrounded by a plurality of dies;

charging molten conductive material into said cavity;

applying pressure to said conductive material by pressure means;

discharging gas from said conductive material by a gas discharge means; and

selectively applying additional pressure to the portion of said conductive material which may suffer shrinkage cavities due to delay in solidification, by utilizing the pressure applied by said pressure means and by relatively moving a portion of said dies with respect to said conductive material during the entire time required for solidification when said conductive material solidifies and shrinks, whereby pressure is applied to the entire cast product to prevent occurrence of said shrinkage cavities, and absorbing movement during solidification between said plurality of dies with a movement absorbing member engaged with at least one of said plurality of dies.

5,067,551

METHOD FOR MANUFACTURING ALLOY ROD HAVING GIANT MAGNETOSTRICTION

Katsuhiko Murakami; Nobuo Yamagami, both of Tokyo; Toshiyuki Nakanishi, Yokosuka; Iwao Nakano, Yokosuka; Keiichi Kobayashi, and Takashi Yokhikawa, both of Tokyo, all of Japan, assignors to NKK Corporation, Tokyo; Japan Marine Science and Technology Center, Yokosuka and Oki Electric Industry Co., Ltd., Tokyo, all of, Japan

Application for reissue Jun. 18, 1990, Ser. No. 539,603

Claims priority, application Japan, Jun. 30, 1989, 1-168454

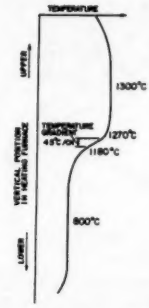
Int. Cl.[5] B22D *27/04*; C30B *11/14*

U.S. Cl. 164—122.2 **14 Claims**

1. A method for manufacturing an alloy rod having giant magnetostriction, which comprises the steps of:

supplying a granular or flaky alloy material, which material comprises at least two rare earth metals comprising terbium and dysprosium and at least one transition metal, into a tubular crucible in an inert gas atmosphere at a pressure of 0.2 to 10 atmospheres, said tubular crucible being arranged in a substantially vertical cylindrical heating furnace;

totally melting said alloy material in said crucible in said heating furnace, and then vertically moving any one of said crucible and said heating furnace at a speed of 0.1 to



5 mm/minute, said moving carried out at a temperature of 1,270 to 1,180° C. of said heating furnace, in which the temperature decreases at a temperature gradient of 10 to 100° C./cm to solidify and crystallize the resultant melt of said alloy material in said crucible in a lower portion of said heating furnace, thereby manufacturing an alloy rod having a large magnetostriction, which comprises a single-crystal structure or a unidirectional-solidification structure in the axial direction thereof

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5,067,552

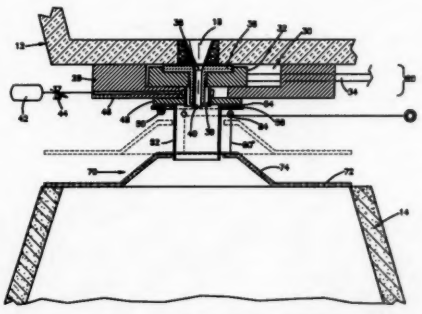
SHROUDING FOR TOP POURING OF INGOTS

Robert G. Petrushka, Brecksville, Ohio, assignor to LTV Steel Company, Inc., Cleveland, Ohio

Filed Jul. 26, 1989, Ser. No. 385,773

Int. Cl.[5] B22D *23/00*

U.S. Cl. 164—259 **16 Claims**



1. Apparatus for shrouding a molten metal stream during a teeming operation involving top pouring of molten metal through a tap hole of a ladle into a mold having a rim defining an upward facing opening, said apparatus comprising:

a) a generally tubular windscreen member affixed to and extending downwardly from the bottom of the ladle, the tubular windscreen member being generally aligned with the tap hole of the ladle;

b) a cover plate adapted for seating on the rim of the mold said cover plate being separable from the mold and defin-

ing a generally central aperture for forming a rough seal with the outer surface of the windscreen member and with the rim of said mold when the windscreen member extends through said aperture and said cover plate is seated upon the upper rim of said mold, and

c) flexible line means for supporting the cover plate in an aligned telescopic relation with the windscreen member, said flexible line means supporting said cover plate for compliant tilting movement about substantially all horizontal axes.

5,067,553

POWDER FEEDER IN CONTINUOUS CASTING

Hiromi Nakajima, Osaka, Japan, assignor to Liner Kabouki Co., Ltd., Osaka and Mitsui & Co., Ltd., Tokyo, both of, Japan

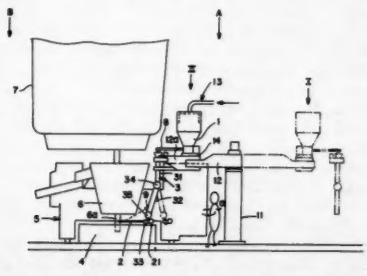
PCT No. PCT/JP89/00436, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO89/10221, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 25, 1989, Ser. No. 455,315

Claims priority, application Japan, Apr. 27, 1988, 63-105765

Int. Cl.[5] B22D *11/10*

U.S. Cl. 164—412 4 Claims



1. A powder feeder for use in continuous casting comprising:

a column;

a revolving tip arm supported by said column;

a powder container for storing final stage casting powder prior to spreading on a molten steel surface in a mold, said powder container being supported by said tip arm and having a discharge end;

a measuring apparatus positioned on said powder container to measure a quantity of powder to be spread on the molten steel surface in the mold;

a robot arm supported by said tip arm;

a spreading feeder for spreading the powder on the molten steel surface in the mold, said spreading feeder positioned lower than said powder container, and supported and manipulated by said robot arm; and

a flexible transfer path connecting said discharge end of the powder container to said spreading feeder for supplying powder from said powder container to said spreading feeder, said powder being fed by gravity through said flexible transfer path, and said flexible transfer path being capable of following movements of said robot arm;

said powder container and said measuring apparatus being positioned in an operator work area and higher than an operator's head.

5,067,554

MELT EXTRACTION OF CERAMICS

Peter Bosswell, Acacias; Dag Richter, Carouge; Tatjana Berce, Geneva, and Guy Negaty-Hindi, Onex, all of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

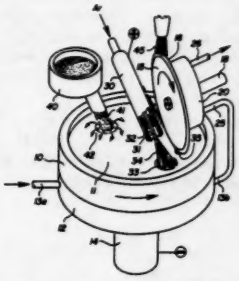
PCT No. PCT/US88/01249, § 371 Date Dec. 9, 1988, § 102(e) Date Dec. 9, 1988, PCT Pub. No. WO88/07979, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 11, 1988, Ser. No. 359,674

Claims priority, application Switzerland, Apr. 10, 1987, 01385/87

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—463 10 Claims



1. A method of producing solidified filament, fibre or particle from a pool of a molten material by the melt extraction technique including rotating a heat extracting disk having a narrow peripheral surface, immersing the peripheral surface into an immersion area in the pool to form a film of the material on the peripheral surface and at least partially solidfying the film on the peripheral surface, and projecting the at least partially solidified film by centrifugal force from the disk as a filament, fibre or particle wherein the improvement comprises

additionally heating a portion of the melt pool surface remote from the disk immersion area sufficient to produce a lower-viscosity region of the melt, and

moving the lower-viscosity region into the disk immersion area.

6. Apparatus for producing solidified filament, fibre or particle from a pool of a molten material by the melt extraction technique comprising

means for maintaining a pool of molten material,

a rotatable, heat extracting disk having a narrow peripheral surface for immersing into an immersion area in the pool forming a film of the material on the peripheral surface, for at least partially solidifying the film on the peripheral surface, and for projecting the at least partially solidified film by centrifugal force from the disk as a filament, fibre or particle,

means for additionally heating a portion of the melt pool surface remote from the disk immersion area sufficient to produce a lower-viscosity region of the melt, and

means for moving the lower-viscosity region into the disk immersion area.

5,067,555

PROCESS AND APPARATUS FOR CONTINUOUS CASTING OF METAL STRIP

Takeshi Ban, Shinnanyo; Shigeru Matsunaga, Tokuyama; Hidemi Hirano, Tokuyama; Tuguo Isobe, Tokuyama, and Yoshio Takakura, Hitachi, all of Japan, assignors to Nisshin Steel Co., Ltd. and Hitachi Ltd., both of Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,770

Claims priority, application Japan, Jul. 11, 1989, 1-178765

Int. Cl.[5] B22D *11/06*

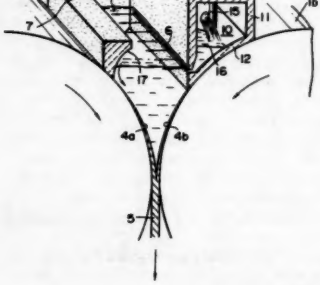
U.S. Cl. 164—480 4 Claims

1. A process for continuously casting a metal strip by means

of a twin roll continuous casting apparatus comprising a pair of internally cooled rolls rotating in the opposite direction of each other and disposed parallel to each other with their axes held horizontally and a pair of side dams for forming a pool of molten metal having a predetermined height on the circumferential surfaces of the pair of rolls, said pair of side dams disposed in the direction perpendicular to the roll axes with a space therebetween approximately corresponding to the width of a metal strip to be cast, said process comprising the steps of continuously pouring molten metal in said pool of molten metal so that the predetermined level of the molten metal may be maintained in the pool, and continuously casting the molten metal in the pool through a gap between the pair of rolls to form a metal strip while cooling the molten metal with the circumferential surfaces of the pair of rolls, said continuous pouring of molten metal further comprising substantially horizontally and unidirectionally flowing said molten metal from one roll towards the other roll and into said pool at a level below the surface of said pool to form a substantially horizontal and unidirectional film flow of molten metal.

3. A twin roll continuous casting apparatus comprising:

i) a pair of internally cooled rolls rotating in the opposite direction of each other and disposed parallel to each other with their axes held horizontal;



ii) a pair of side dams for forming a pool of molten metal having a predetermined height on the circumferential surfaces of the pair of rolls, said pair of side dams disposed in the direction perpendicular to the roll axes with a space therebetween approximately corresponding to the width of a metal strip to be cast; and

iii) a pair of longitudinal dams having respective inside walls along the roll axes to form the pool of molten metal together with the pair of side dams and having respective bottom surfaces, the circumferential surfaces of the pair of rolls being disposed in such a manner that the bottom surfaces of the longitudinal dams slidably contact the circumferential surfaces of the pair of rolls;

iv) one of the longitudinal dams having an inner hollow space within the body of said longitudinal dam and a slit-like opening on the inside wall thereof, said slit like opening horizontally extending in the direction of the roll axes and communicating with said inner hollow space whereby said longitudinal dam having the inner hollow space and the slit-like opening forms an intermediate tundish for pouring molten metal into said pool;

v) whereby continuously cast metal strip is formed by continuously pouring molten metal from the intermediate tundish into said pool and through said gap while cooling the molten metal with the circumferential surfaces of the pair of rolls.

5,067,556

CONTROLLER OF REFRIGERATING PLANT

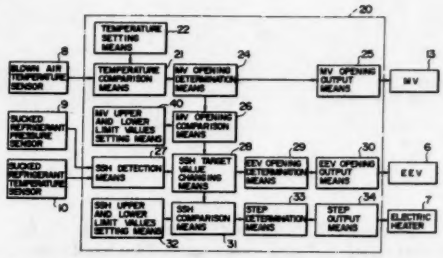
Kanji Fudono; Toshimasa Takahashi, both of Nagoya; Hiroshi Ogawa, and Toshio Yamashita, both of Aichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1990, Ser. No. 596,030

Claims priority, application Japan, Oct. 13, 1989, 1-120256[U]

Int. Cl.[5] F25B *29/00*

U.S. Cl. 165—29 **2 Claims**



1. In a controller of a refrigerating plant equipped with each of

(a) a compressor;

(b) a condenser;

(c) an evaporator having an opening;

(d) a hot gas bypass circuit for leading a high temperature refrigerant gas discharged from said compressor to said evaporator;

(e) an electric heater for heating air emitted from said evaporator;

(f) a hot gas control valve inserted in said hot gas bypass circuit and having an opening adjustable in response to the difference between the temperature of an object to be cooled and a preset temperature;

(g) an electronic expansion valve for controlling the degree of superheat of the refrigerant at the outlet of said evaporator; and

(h) means for changing the control target value for the degree of superheat of said electronic expansion valve in response to the opening of said hot gas control valve, the improvement comprising:

control means for turning on said electric heater when said degree of superheat of the refrigerant exceeds its upper limit preset value, and for turning off said electric heater when said degree of superheat of the refrigerant falls below a lower limit preset value.

5,067,557

MACHINE UNIT CONSISTING OF A ROTARY PISTON INTERNAL COMBUSTION ENGINE AND A ROTARY PISTON COMPRESSOR

Roland Nuber; Werner Schubert, both of Lindau; Wolfgang Sohler, Wangen, and Franz Sutter, Lindau, all of Fed. Rep. of Germany, assignors to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Feb. 23, 1990, Ser. No. 483,889

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1989, 3930901

Int. Cl.[5] F25B *27/00*

U.S. Cl. 165—51 **3 Claims**

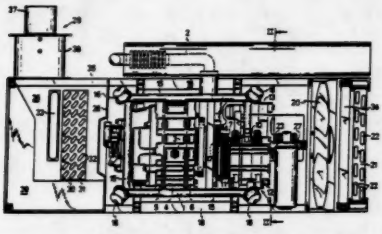
1. A machine installation, consisting of a rotary piston internal combustion engine with a housing, the housing being fluid cooled and including a shaft which passes axially through the housing, whereby said shaft is connected positively via a belt drive with a refrigeration compressor of the same type of construction as the internal combustion engine, comprising:

a) a housing frame clad with an external sheeting and connected with an inner tubular frame via oscillation dampers

of elastically deformable synthetic material, in which frame the internal combustion engine and the refrigeration compressor as well as the power supply generator axially parallel beside the refrigeration compressor are arranged and the internal combustion engine having an output shaft is connected positively with a belt drive;

b) at an end face of the housing frame there are arranged a condenser for the return flow of the refrigerating medium of the refrigeration compressor and there behind a shaft connection equalizing the vibrations between the tubular frame and the housing frame is arranged extending across to the drive shaft of the fan wheel driven by the internal combustion engine;

c) in a rear part of the housing frame located opposite to the fan wheel there is provided a climatization air conditioning system which behind the inlet opening for environmental air has an evaporator for refrigeration operation



capable of having cooling medium of the refrigeration compressor flowing therethrough vaporized in an expansion valve arranged therebefore and behind this having a heat exchanger for the cooling water of the internal combustion engine for heating operation as well as a blower for the climatized air/conditioned air and located in a discharge tube; and

d) in a cooling water circulation of the internal combustion engine there is provided a shift valve with which outcome thereof upon switching from heating operation to cooling operation causes circulation to be diverted from the heat exchanger in the climatization air condition system to a radiator, which is arranged between the fan wheel and the condenser and furthermore a magnetic coupling is provided between the drive pulley and the refrigeration compressor with which the refrigeration compressor can be brought to a standstill during heating operation.

5,067,558

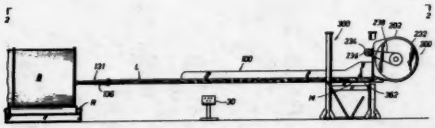
MULTI-LANCE TUBE CLEANING SYSTEM

Thomas B. Boisture, Baytown, Tex., assignor to Ohmstede Mechanical Services, Inc., Baytown, Tex.

Continuation-in-part of Ser. No. 490,776, Mar. 8, 1990, Pat. No. 5,002,120. This application Oct. 19, 1990, Ser. No. 600,485

Int. Cl.[5] F22B *9/08*

U.S. Cl. 165—95 **20 Claims**



1. A multi-lance cleaning apparatus for cleaning the interior of heat exchanger tubes comprising:

an elongate hollow housing having first and second ends;

a hollow manifold slidably moveable within said housing, said manifold having a plurality of interconnected channels and outlets;

a conduit for connecting said manifold with a high pressure, high volume fluid source, said conduit having a first end and a second end, said first end of said conduit being adapted to be removably connected to said manifold and said second end of said conduit being adapted to removably connected to a high pressure, high volume fluid source;

a spool for storage of said conduit to permit said conduit to advance and retract, said spool storage being in close proximity to said first end of said housing;

means for securing and supporting said conduit within said spool;

means for moving said manifold within said housing from a first retracted position to a second extended position;

a plurality of hollow tubular lances, the outer diameter of each said lance being adapted to fit within a heat exchanger tube, said lance having a first end and a second end, said first end of each said lance being removably attached to said manifold and in communication with said fluid source, said second end of said lance being in proximity to said second end of said housing, said lances moving in response to the movement of said manifold;

means for supporting and guiding the movement of said lances; and

means for supporting and positioning said second end of housing and said second end of said lances with respect to a heat exchanger tube bundle to be cleaned.

5,067,559

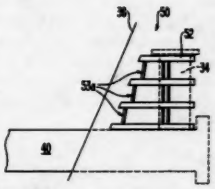
DIFFUSER SCREEN FOR SPARGER NOZZLE

Seth Perkinson, Charlotte, N.C., assignor to CDP Product Development Corporation, Mount Airy, Md.

Filed Sep. 18, 1990, Ser. No. 584,270

Int. Cl.[5] F28B *3/04*

U.S. Cl. 165—112 **11 Claims**



1. An apparatus for diffusing a fluid stream, comprising:

a source of fluid for directing a stream of said fluid in a first direction;

a target for receiving said stream of said fluid upstream of said source in said first direction; and

means interposed between said source and said target for diffusing said stream, said diffusing means comprising a screen having a plurality of openings therein for dispersing said stream, said source of fluid being a sparger nozzle, said target being a component of a condenser in a steam generating unit.

5,067,560

CONDENSER COIL ARRANGEMENT FOR REFRIGERATION SYSTEM

Michael D. Carey, Holmen; William A. Smiley, III, Stoddard, and Gerald A. Jansky, La Crosse, all of Wis., assignors to American Standard Inc., New York, N.Y.

Filed Feb. 11, 1991, Ser. No. 653,836

Int. Cl.[5] F25B *39/04*

U.S. Cl. 165—124 **23 Claims**

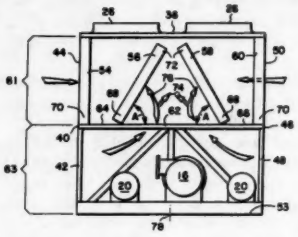
1. A condenser for an air conditioning or refrigeration system having first, second, third and fourth condenser coils arranged in a substantially W-shaped arrangement wherein the first and fourth coils are substantially perpendicular to a con-

denser base and are respectively located on an exterior side of the second and third coils.

11. A condenser for a refrigeration system comprising:

a housing including first and second air inlets;

four condenser coils located in said housing; and



means for circulating air wherein three of the four coils are provided with air by either of said first or second air inlets wherein the air inlets are located on opposing sides of the housing.

5,067,561

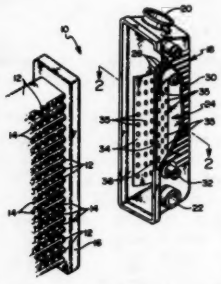
RADIATOR TANK OIL COOLER

Shrikant M. Joshi, Getzville, and Frederick V. Oddi, Orchard Park, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1990, Ser. No. 620,169

Int. Cl.[5] F01P *11/08;* **F28F** *9/22, 9/26*

U.S. Cl. 165—140 **6 Claims**



1. In combination, a motor vehicle radiator having a tank, a plurality of radiator tubes connected at one end thereof to said tank, a fitting on said tank for directing liquid into or out of said tank to or from respectively the one end of said radiator tubes, an oil cooler mounted in said tank between the one end of said radiator tubes and said fitting, said oil cooler having a row of tubes extending past and open to the one end of said radiator tubes, said tank having an interior side facing said oil cooler, and baffle means on opposite sides of the one end of said radiator tubes extending between said interior side of said tank and the oil cooler tubes so as to force liquid flowing between said fitting and the one end of said radiator tubes to pass transversely between said oil cooler tubes.

5,067,562

HEAT EXCHANGER HAVING FINS WHICH ARE DIFFERENT FROM ONE ANOTHER IN FIN THICKNESS

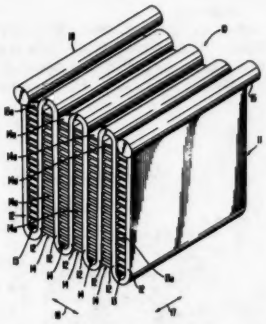
Yutaka Ishii, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Apr. 25, 1989, Ser. No. 343,816

Claims priority, application Japan, Apr. 25, 1988, 63-54562[U]

Int. Cl.[5] F28F *13/00*

U.S. Cl. 165—146 **3 Claims**



1. A heat exchanger for carrying out heat exchange between a first fluid and a second fluid, said heat exchanger comprising a tube for conducting said second fluid therethrough and a plurality of fins mounted on an outer surface in contact with said first fluid flowing through gaps between said fins, said first fluid having a flow energy distribution within a lateral section of the flow of said first fluid, wherein said plurality of fins have different fin thicknesses including a first set of fins having a comparatively large thickness and a second set of fins having a comparatively small thickness, said first and said second sets of fins being arranged within said lateral section of the flow of the first fluid so that a comparatively high flow energy portion of said first fluid flows into said first set of fins while another comparatively low flow energy portion of the first fluid flows into said second set of fins, said fins being arranged with a predetermined pitch in each of said first and second sets of fins.

5,067,563

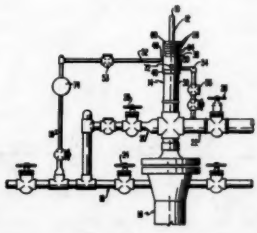
SPILLPROOF OIL WELL SEAL

Walter H. Rode, Calle B, Q, Los Mangos, Urb. Los Marios, Caracas, Venezuela

Filed Mar. 6, 1991, Ser. No. 665,076

Int. Cl.[5] E21B *33/03*

U.S. Cl. 166—84 **15 Claims**



1. A sealing system for a hydrocarbon-producing well including a motor driven pump connected through a plurality of sucker rods to a polished rod driven by the motor to reciprocate axially within a well tubing to pump liquid and gas hydrocarbons from a hydrocarbon deposit through a production line to a storage facility, wherein said sealing system includes:

(a) dual function liquid sealing means for centering the polished rod and for preventing the passage of all but a controlled amount of liquid hydrocarbon;

(b) liquid/gas separation means located above said liquid sealing means for maintaining liquid hydrocarbon separate from gas hydrocarbon, said separation means including discharge means for directing excess gas and liquid hydrocarbons to the well production line;

(c) gas seal means located around said polished rod above said liquid/gas separation means for preventing the passage of hydrocarbon gases from the well to the atmosphere; and

(d) compressor means for directing a supply of pressurized hydrocarbon gas from the well to the gas seal means to seal the well.

5,067,564

SELECTIVE PLACEMENT OF A PERMEABILITY-REDUCING MATERIAL TO INHIBIT FLUID COMMUNICATION BETWEEN A NEAR WELL BORE INTERVAL AND AN UNDERLYING AQUIFER

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Oct. 12, 1990, Ser. No. 596,796

Int. Cl.[5] E21B *33/138, 43/22*

U.S. Cl. 166—270 **18 Claims**

13. A process for selectively placing a permeability-reducing gel in a near well bore hydrocarbon production interval to substantially reduce water coning resulting from fluid communication between said interval and an underlying aquifer comprising:

injecting an immature flowing crosslinked polymer gel into an upper portion and lower portion of said near well bore hydrocarbon production interval, wherein said immature flowing gel comprises an acrylamide-containing polymer and a metal cation-containing crosslinking agent;

injecting an overdisplacing gas having a density substantially less than said immature flowing gel and substantially immiscible with said immature flowing gel into said upper portion of said near well bore hydrocarbon production interval to displace said immature flowing gel from said upper portion of said interval;

shutting in said well bore for a time sufficient to enable said immature gel in said lower portion of said interval to mature into a nonflowing gel; and

producing hydrocarbons across said upper portion of said interval while substantially reducing water coning therein.

5,067,565

CROSSLINKABLE CELLULOSE DERIVATIVES

Marlin Holtmyer, and Charles V. Hunt, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 322,155, Mar. 10, 1989, Pat. No. 4,982,793. This application Oct. 4, 1990, Ser. No. 592,770

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.[5] E21B *43/04, 43/25, 43/26*

U.S. Cl. 166—305.1 **13 Claims**

1. A method of treating a subterranean formation comprising:

preparing a treating fluid composition with or without a particulate agent by admixing: (i) an aqueous liquid, (ii) a cellulose ether derivative that is chemically modified by reacting said cellulose ether derivative with a vinyl phosphonic acid in the presence of the reaction product of hydrogen peroxide and a ferrous salt and (iii) a crosslinking agent; and injecting said treating fluid composition into said subterranean formation through a wellbore;

injecting said treating fluid composition into said subterranean formation through a wellbore.

5,067,566

LOW TEMPERATURE DEGRADATION OF GALACTOMANNANS

Jeffrey C. Dawson, Spring, Tex., assignor to BJ Services Company, Houston, Tex.

Filed Jan. 14, 1991, Ser. No. 640,957

Int. Cl.[5] E21B *43/26*

U.S. Cl. 166—308 **9 Claims**

1. A method of fracturing a subterranean formation comprising the steps of:

formulating a gellable fracturing fluid by blending together an aqueous fluid, a hydratable polymer, a suitable crosslinking agent for crosslinking the hydratable polymer to form a polymer gel, and an enzyme breaker;

raising the pH of the fracturing fluid above about 9.0 to 10.5 whereby the enzyme breaker is inert;

incorporating within the fracturing fluid a pH regulating substance which slowly hydrolyzes to produce a Bronsted acid, thereby dropping the pH of the fracturing fluid and activating the enzyme breaker with time to produce a controlled break of the polymer gel, the breaker being effective to degrade the polymer gel at temperatures below about 140–150 degrees F. within a time period less than about 24 hours.

5,067,567

REMOTE HANDLING APPARATUS

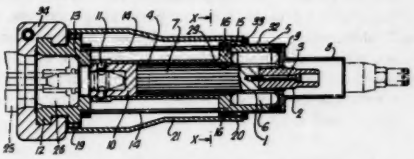
Duncan A. Webster, Warrington, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, England

Filed May 14, 1990, Ser. No. 523,343

Claims priority, application United Kingdom, May 23, 1989, 8911826

Int. Cl.[5] B23Q *5/00*

U.S. Cl. 173—141 **5 Claims**



1. Remote handling apparatus comprising a tool carrier slidable axially along its longitudinal axis within a support member between extended and retracted positions, said tool carrier being connected for rotation with the support member, a housing for transmitting rotational drive to the tool carrier, and means for accommodating misalignment between a tool on the tool carrier and an object to be engaged by the tool to permit lateral adjustments of the tool carrier perpendicular to the longitudinal axis of the tool carrier while maintaining the longitudinal axis of the tool carrier parallel to the longitudinal axis before adjustment, said means for accommodating misalignment comprising elongated resilient members connected between an end of the support member, on the one hand, and said housing for transmitting rotational drive to the tool carrier, on the other hand.

5,067,568

WELL PERFORATING GUN

Donald N. Yates, Jr., Cape Carancahua, and William D. Myers, Jr., Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 25, 1990, Ser. No. 514,168

Int. Cl.[5] E21B *43/117*

U.S. Cl. 175—4.52 **7 Claims**

1. A perforating gun for insertion into a wellbore into a formation, comprising:

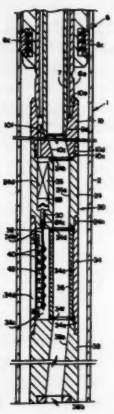
a tubular housing;

a tubular element, defining a flow passage, extending unin-

terruptedly over the length of said housing in flow communication with both ends of said tubular housing and providing an opening at its extremities of similar cross-sectional open area as the cross-sectional area of said flow passage within said tubular housing;

a gun chamber defined between said flow passage and said tubular housing;

a plurality of perforating elements so arranged within said gun chamber so that their firing orientation does not



exceed a formation penetration of about 180 degrees measured from the longitudinal axis of said tubular housing;

detonating means mounted at least in part in said gun chamber and outside and independent of said tubular element for selective detonation of said perforating elements;

said tubular element remaining unobstructed before, during, and after activation of said detonating means; and

whereupon, subsequent to said actuation of said detonating means, said flow passage is broad enough to permit insertion of well tools therethrough.

5,067,569

AUGER AND SWEEPER ASSEMBLY

John T. Gilcrease, 7000 W. Gilcrease Ave., Las Vegas, Nev. 89131

Filed Aug. 31, 1990, Ser. No. 576,592
Int. Cl.[5] E21B *7/00, 21/00*
U.S. Cl. 175—209 **5 Claims**

1. An auger assembly comprising:

a) an auger support frame,

b) an auger blade mounted for vertical movement on the auger support frame,

c) a first motor operatively associated with the auger blade for rotating the auger blade to dig a hole,

d) a sweeper drive assembly mounted on the auger support frame, the sweeper drive assembly including

1) a guide drum mounted for rotary movement and having at least one sweeper arm mounted thereon,

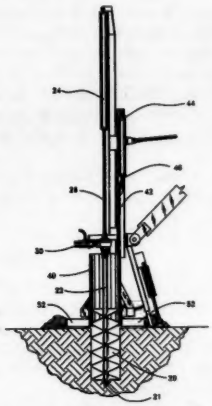
2) an L-shaped frame mounted around the guide drum,

3) at least one guide wheel mounted on the L-shaped frame for guiding the guide drum during rotation, and

4) a drive chain operatively associated with the drive guide for rotating the guide drum when the second motor is activated,

e) at least one sweeper arm mounted on the sweeper drive assembly, and

f) a second motor mounted on the sweeper drive assembly and connected to the sweeper arm for rotating the



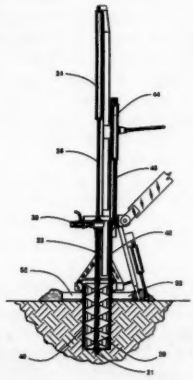
sweeper arm to clean dirt away from the hole, the sweeper arm being operable independent from the auger blade.

5,067,570

AUGER AND RETAINING SHELL ASSEMBLY

John T. Gilcrease, 7000 W. Gilcrease Ave., Las Vegas, Nev. 89131

Filed Aug. 31, 1990, Ser. No. 576,275
Int. Cl.[5] E21B *7/00, 21/00*
U.S. Cl. 175—209 **7 Claims**



1. An auger assembly comprising:

a) an auger support frame;

b) an auger blade mounted for vertical movement on the auger support frame,

c) a first motor operatively associated with the auger blade for rotating the auger blade to dig a hole,

d) a sweeper drive assembly mounted on the auger support frame, the sweeper drive assembly comprising

1) a guide drum mounted for rotary movement and having at least one sweeper arm mounted thereon,

2) an L-shaped frame mounted around the guide drum,

3) at least one guide wheel mounted on the L-shaped frame for guiding the guide drum during rotation, and

4) a drive chain operatively associated with the drive guide for rotating the guide drum when the second motor is activated,

e) at least one sweeper arm mounted on the sweeper drive assembly,

f) a second motor mounted on the sweeper drive assembly and connected to the sweeper arm for rotating the sweeper arm to clean dirt away from the hole, the sweeper arm being operable independent from the auger blade,

g) a retaining shell support frame, and

h) a retaining shell mounted for vertical movement on the retaining shell support frame, the retaining shell being movable independently from the auger blade so that the retaining shell can be lowered into surrounding relationship with the auger blade to retain loose dirt on the auger blade as the auger blade is withdrawn from the hole.

5,067,571

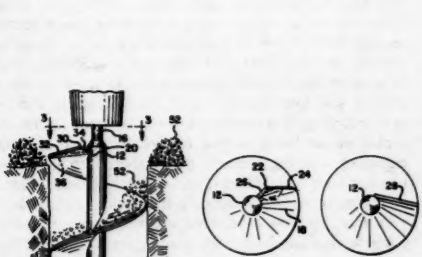
AUGER PLANTER

D. Wayne Niewold, Loda, and Richard A. Bradley, Urbana, both of Ill., assignors to Power Planter, Inc., Paxton, Ill.

Continuation of Ser. No. 178,531, Apr. 7, 1988, abandoned. This application Aug. 1, 1989, Ser. No. 388,744

Int. Cl.[5] E21B *10/44*

U.S. Cl. 175—394 30 Claims



1. An auger planter for the forming of small diameter holes in the soil of a depth suitable for the planting of flower bulbs and the like, comprising a helical flighting for advancing into the soil and a central shaft extending substantially axially through said helical flighting, said central shaft terminating at one end in a leading end of said shaft, said helical flighting terminating in a leading edge proximate to said leading end of said shaft, said helical flighting having an outer helically extending edge, said leading edge being defined by a chord portion extending chordally substantially across the flighting on one side of said shaft to a point of intersection with said helically extending edge and away from the direction of advance of said flighting into the soil, said helical flighting having a diameter and distance between adjacent flights which are approximately equal to each other, said helical flighting extending more than one revolution about said shaft and along said shaft for a distance greater than the depth of the hole to readily lift the soil from the hole as the flighting is advanced into the hole, and said leading edge further including a radial portion extending outwardly from said central shaft to a point of intersection with said chord portion.

11. An auger planter for the forming of small diameter holes in the soil of a depth suitable for the planting of flower bulbs and the like, comprising an auger having a central shaft and helical flighting for advancing into the soil, said central shaft terminating at one end in a tapered leading end, the other end of said central shaft terminating in a trailing end adapted to be mounted in a hand held power drill, said flighting terminating in a leading edge proximate to said shaft leading end, said leading edge being blunt and having a chord portion extending chordally substantially across said flighting, said chord portion being angularly disposed to said central shaft such that the line of sight along said chord portion does not intersect the center of said central shaft and away from the direction of advance of said flighting into the soil, said helical flighting having a diameter and distance between adjacent flights which are approximately equal to each other, said helical flighting extending more than one revolution about said shaft along said shaft for a distance greater than the depth of the hole to readily lift soil from the hole as the flighting is advanced into the hole.

5,067,572

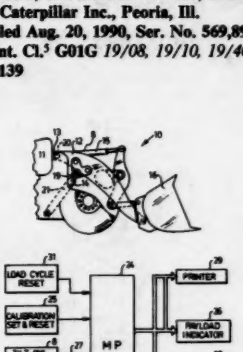
DYNAMIC PAYLOAD MONITOR

Christos T. Kyrtsos, and Dean A. Worrell, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 20, 1990, Ser. No. 569,899

Int. Cl.[5] G01G *19/08, 19/10, 19/40*

U.S. Cl. 177—139 14 Claims



1. An apparatus for dynamically measuring and indicating payload weight for a vehicle having at least one implement linkage including a linkage connection pivot pin, said vehicle including at least one lift cylinder and at least one tilt cylinder for modifying said implement linkage geometry, said apparatus comprising:

means for sensing the hydraulic pressure of said lift cylinder and responsively producing a first signal;

means for sensing the hydraulic pressure of said tilt cylinder and responsively producing a second signal;

means for sensing said implement linkage geometry and responsively producing a third signal; and

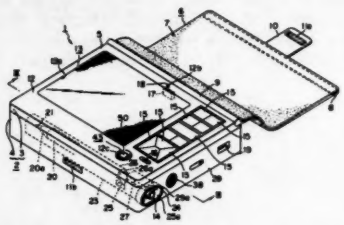
means for receiving said first, second, and third signals and responsively deriving a payload weight.

5,067,573

HAND-WRITING INPUT APPARATUS

Hiroshi Uchida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 26, 1990, Ser. No. 633,666
Claims priority, application Japan, Dec. 27, 1989, 1-344626
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 16 Claims



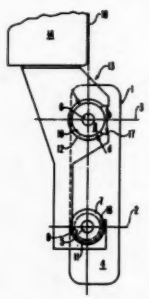
1. An electronic tablet which receives handwritten information via an input pen including a receptacle for the pen and a detector operative to detect the presence of the pen in the receptacle.

5,067,574

MOUNTING FOR A COOLER

Thomas Attinger, and Frank Plonus, both of Stuttgart, Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 5, 1990, Ser. No. 593,069
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933410
Int. Cl.[5] B60K *11/04*
U.S. Cl. 180—68.4 7 Claims



1. Mounting for a cooler on a motor vehicle, said cooler having first and second end surfaces at opposite narrow ends thereof, said mounting comprising:

a first pair of journals arranged on said first end surface;

a second pair of journals arranged on said second end surface;

one journal of each of said first and second pairs of journals lying in a first plane, and the other journal of each of said first and second pairs of journals lying in a second plane substantially parallel to said first plane;

a first support member fixed to said vehicle and having bearing bores corresponding to and adapted to receive and hold said first pair of journals;

a second support member fixed to said vehicle and having bearing bores corresponding to and adapted to receive and hold said second pair of journals;

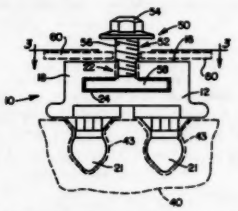
each of said bearing bores having a receiving slot for receiving a corresponding journal, said receiving slots for receiving the journals lying in said first plane being spatially offset at an angle of about 90 degrees relative to receiving slots for receiving the journals lying in said second plane.

5,067,575

HEAT SHIELD RETAINER

James P. Hyde, Saline, and Thomas J. Bryans, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 16, 1990, Ser. No. 516,002
Int. Cl.[5] B60K *15/03*
U.S. Cl. 180—69.4 16 Claims



1. A fuel tank/heat shield assembly comprising:

a fuel tank formed of polymeric material and having a wall with an inner surface and an outer surface;

a heat shield for shielding said fuel tank; and

retainer means for mounting said heat shield to said fuel tank, said retainer means including a retainer body having a first side and a second side, peg fastening means located on said first side of said retainer body for securing said retainer body to said fuel tank and attachment means located on said second side of said retainer body for attaching said heat shield to said retainer body, said fuel tank including socket means formed in said fuel tank, said socket means being shaped for receiving and lockingly engaging said peg fastening means therein to secure said retainer body to said fuel tank, said socket means forming an enclosed chamber extending from said outer surface to a location positioned between said inner surface and said outer surface and having an opening formed in said outer surface, said peg fastening means having a portion with a defined cross-sectional area, and said chamber having a constricted portion with a cross-sectional area which is less than said defined cross-sectional area of said portion of said peg fastening means.

5,067,576

VARIABLE EFFORT STEERING SYSTEM

Gregory D. Bober, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 15, 1990, Ser. No. 567,578
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 17 Claims

1. In a vehicle having frame which supports a steering shaft for receiving torque applied manually by a driver through a steering wheel and for transmitting the manually applied torque through a steering gear to steerable wheels without power assist, a variable effort steering system comprising:

a variable load actuator including

a rotary member mounted upon the steering shaft, said rotary member and the steering shaft turning together in response to the manually applied torque;

a stationary member at least partially surrounding said rotary member and including at least one core extending towards said rotary member; and

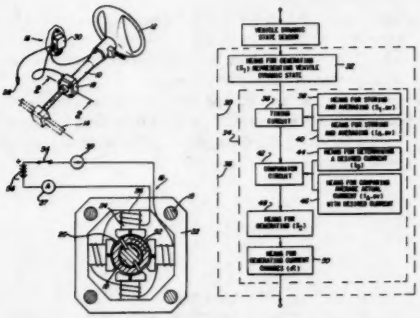
windings surrounding at least one of said at least one core, so that when a current (I_A) is delivered through said windings, a magnetic field is produced and a holding torque (T) is exerted on said rotary member, the holding torque (T) resisting the manually applied torque and turning motion of said rotary member and the steering shaft;

means for measuring a current (I_A) in communication with said windings;

a sensor mounted on the frame for sensing a dynamic state of the vehicle; and

an electronic control module mounted on the frame, including

means for generating a first electrical signal (S_1) representing the dynamic state of the vehicle, said means for generating being in communication with said sensor; and



means for varying the current (I_A) in response to said first electrical signal (S_1), said means for varying the current (I_A) being in communication with said windings of said variable load actuator and producing changes to the holding torque (T) exerted thereby upon the steering shaft in response to the dynamic state of the vehicle, thereby changing in accordance with the vehicle's dynamic state the manually applied torque required to maintain the vehicle along a desired path.

5,067,577

MOTOR-DRIVEN TYPE FRONT AND REAR WHEEL STEERING APPARATUS

Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed May 16, 1990, Ser. No. 523,790

Claims priority, application Japan, May 24, 1989, 1-131825

Int. Cl.[5] B62D *5/04*

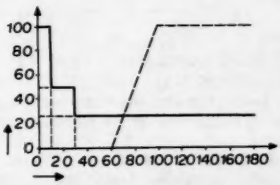
U.S. Cl. 180—79.1 **2 Claims**

1. A motor-driven type front and rear wheel steering apparatus for steering the front and rear wheels of an automobile while preventing excessive current draw from a battery or a generator of the automobile, said apparatus comprising:

a steering sensor to detect at least one of a steering torque and a steering angle,

a motor-driven type power-assisted steering unit to assist in steering the front wheels in response to a signal based on at least one of said steering torque and said steering angle from the steering sensor,

a motor-driven type rear wheel steering unit to drive the steering of the rear wheels in response to at least one of a signal indicating the steering torque and a signal indicating the steering angle which are generated from the steering sensor, and



a control unit which receives a plurality of signals from each of the steering sensor, a vehicle speed sensor, a motor turning angle speed sensor and a rear wheel steering angle sensor so as to control the motor-driven type power-assisted steering unit and the motor-driven type rear wheel steering unit, wherein the control unit actuates only the motor-driven type power-assisted steering unit when the automobile stops or runs at a low speed, and actuates a selected one of the motor-driven type power-assisted steering unit and the motor-driven type rear wheel steering unit when the automobile runs at an intermediate speed or at a high speed.

5,067,578

TRACTION CONTROL SYSTEM FOR MOTOR VEHICLES

Akihiro Shirata, Yokohama; Hideaki Watanabe, Chigasaki; Naoyuki Hagiya, Ageo; Satomi Ookubo, Kuki, and Shigeki Moride, Yokohama, all of Japan, assignors to Isuzu Motors Limited; Fujitsu Limited; Akebono Brake Industry Co., Ltd. and Akebono Research and Development Centre Ltd., Japan

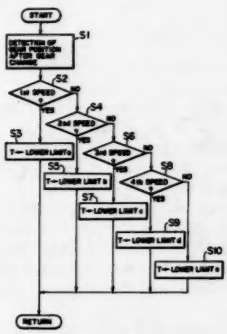
Continuation of Ser. No. 286,989, Dec. 20, 1988, abandoned.

This application Oct. 3, 1990, Ser. No. 593,494

Claims priority, application Japan, Dec. 28, 1987, 62-329670

Int. Cl.[5] B60K *31/00*

U.S. Cl. 180—197 **7 Claims**



1. A traction control system for a motor vehicle having a throttle, and a transmission; said system comprising: means for detecting driving wheel slip, means for changing a command

value for opening the throttle depending on said driving wheel slip, means for controlling the degree of opening of the throttle in accordance with the throttle opening degree command value to restrain said driving wheel slip; means for detecting each gear position of the transmission; means for setting a lower limit value for the throttle opening degree command value with respect to each gear position of the transmission as detected; said means for setting a lower limit value including means for setting a different value for each respective gear position so that each value is different from any other value and corresponds to a different degree of opening for the throttle then for any other value; and means, for causing said throttle opening degree command value to be decreased down to the lower limit value upon a gear change of the transmission up or down.

5,067,579

SLIP CONTROL SYSTEM FOR A VEHICLE PROVIDED WITH AN INTERNAL COMBUSTION ENGINE

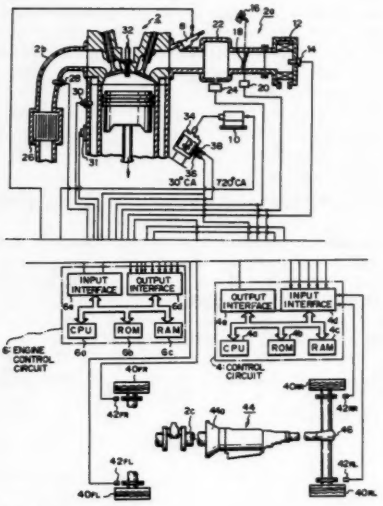
Naoto Kushi; Toshio Takaoka, and Motoyasu Muramatsu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 26, 1990, Ser. No. 484,865

Claims priority, application Japan, Mar. 2, 1989, 1-50843; Aug. 8, 1989, 1-205398

Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 **5 Claims**



1. A vehicle comprising:

a vehicle body;

drive wheels on the vehicle body;

non-drive wheels on the vehicle body:

an internal combustion engine in the vehicle body;

a gear train for kinematically connecting the internal combustion engine to the drive wheels;

said internal combustion engine comprising:

an engine body having a plurality of cylinders;

spark plugs arranged at each of the cylinders;

intake means for introducing air into the cylinders;

exhaust means for removing resultant exhaust gas from the cylinders;

fuel introducing means for introducing an amount of fuel into the intake means for defining a combustible air-fuel mixture to be introduced into the cylinders;

means for controlling the amount of fuel to be introduced into the intake means from the fuel introducing means for controlling the air-fuel ratio of the air-fuel mixture;

means for controlling timing of a spark signal to each spark plug to obtain a desired ignition time;

means, responsive to a knocking condition of the engine, for adjusting said desired setting of the ignition timing for suppressing knocking in the engine;

means for detecting the speed of the drive wheels of the vehicle;

means, based on the detected value of the drive wheel speed, for detecting slippage of the drive wheels when the vehicle is accelerated;

means, based on the detected slippage at the drive wheels, for allowing a setting of the torque applied to the drive wheels to be reduced, to suppress slippage during an acceleration of the vehicle; and

means for cancelling the operation of the knocking control means so that a control of the ignition timing based on the engine knocking condition is stopped during the operation of said torque control means.

5,067,580

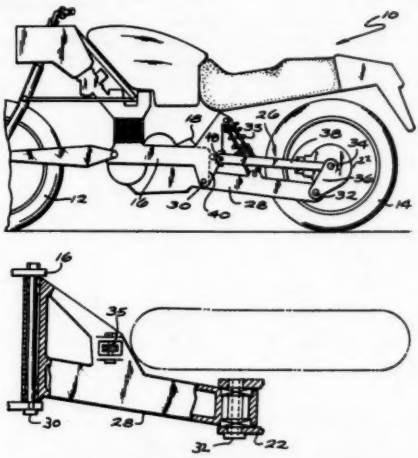
ANTI-SHAFT EFFECT MOTORCYCLE SUSPENSION

James Parker, 102 So. Capitol, Santa Fe, N. Mex. 87501

Continuation of Ser. No. 196,348, May 20, 1988, abandoned. This application Aug. 21, 1990, Ser. No. 570,214

Int. Cl.[5] B62K *25/20*; B62M *17/00*

U.S. Cl. 180—219 **11 Claims**



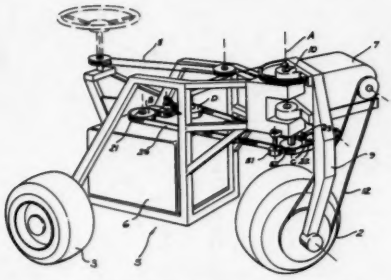
1. Anti-shaft effect single side suspension for a motorcycle having a frame, a front wheel, a rear wheel axle, and a rear wheel driven by a shaft having a ring and pinion gear arrangement within a housing coaxial with said rear wheel axle, said suspension comprising a swing arm, a link arm, and a pair of substantially parallel bars in a four bar linkage to direct acceleration and deceleration induced reactive energy in said housing into said frame in shaft effect blocking relation, said swing arm being pivoted at said frame and pivoted at said housing and connecting said rear wheel to said frame, said swing arm pivot at said housing being in offset relation to the axle of said rear wheel, said link arm being pivoted at said frame and at said axle, and spaced above said swing arm.

5,067,581

ARTICULATED DRIVE WITH A BELT AND PULLEY ARRANGEMENT

Alexander N. Nicol, 102-104 Dampier Street, Barellan Point, Queensland 4305, Australia

Filed Jul. 11, 1990, Ser. No. 551,018
Claims priority, application Australia, Jul. 11, 1989, PJ5189
Int. Cl.[5] B60K *17/30*; B62D *61/06*; F16H *7/12*
U.S. Cl. 180—254 5 Claims



1. An articulated system for an articulated drive motor vehicle, said system comprising:

a power source and steerable driving means located on opposite sides of a pivot axis of said articulated motor vehicle.

drive pulley means and load pulley means,

drive belt means for enabling said drive pulley means to turn said load pulley means, and

idler pulley means and belt tensioning means,

said idler pulley means and said belt tensioning means being positioned between said drive pulley means and said load pulley means and being in contact with said drive belt means for cooperation therewith,

said idler pulley means being adjacent to said pivot axis, and

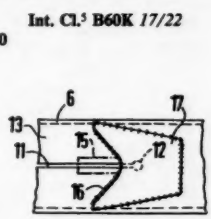
said belt tensioning means providing tension to said drive belt means for centering said steerable driving means when said articulated vehicle is in a pivoted state.

5,067,582

DRIVE ASSEMBLY FOR MOTOR VEHICLES

Robert Müller, Mönsheim, and Egon Eisenhauer, Heimsheim, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Feb. 5, 1990, Ser. No. 475,322
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903941
Int. Cl.[5] B60K *17/22*
U.S. Cl. 180—380 7 Claims



1. A drive assembly for a motor vehicle having a vehicle body, a front power unit which is elastically supported on the vehicle body, and a rear drive unit, the drive assembly comprising:

a center tube rigidly connected between the front power unit and the rear drive unit of the vehicle, a drive shaft extending through the center tube; wherein

the center tube has at least one longitudinal slot which is adjacent to the front power unit, the slot having dimensions and configurations such that a torsional rigidity of the center tube is reduced, thereby reducing a torsional natural frequency of the drive assembly below a driving rotational speed range; wherein the longitudinal slot is axially limited in its length;

wherein the longitudinal slot has two ends which have shapes and configurations for counteracting crack formation at the ends of the longitudinal slot; wherein

these ends are partially covered by a tab which is fixedly connected with the center tube; and wherein

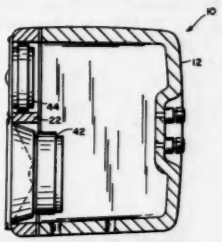
this tab has a curved edge facing the central portion of the longitudinal slot.

5,067,583

POLYMER-FILLED AUDIO LOUDSPEAKER CABINET

Dana B. Hathaway, 9 Swetts Hill, Amesbury, Mass. 01913

Filed Aug. 6, 1990, Ser. No. 563,262
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—151 7 Claims



1. A loudspeaker cabinet which consists of:

an enclosure having a front and a baffle each formed from a non-foamed molded filled polymer having between 20–90% inert filler and a density of between 1.0–6.0 gm/cm^3;

the polymer selected from the group which consists of polyester, polycarbonate, polysulfone, polyvinyl chloride, polyvinyl acetate and/or polyurethane; and

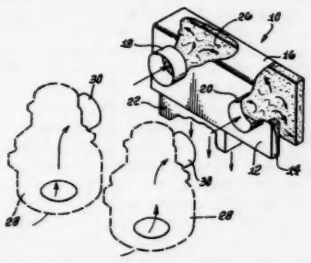
the molded baffle secured to the font of the enclosure and having first and second openings therein, the enclosure and baffle having mounting surfaces for directly securing loudspeaker components thereto.

5,067,584

LOW COST REPLACEABLE TYPE SOUND DAMPENING UNIT FOR VACUUM CLEANING MACHINE

William H. Williams, 4938 Golden Arrow Dr., Rancho Palos Verdes, Calif. 90274, and Paul G. Jacobs, 9958 Amestoy Ave., Northridge, Calif. 91325

Filed Apr. 25, 1990, Ser. No. 514,521
Int. Cl.[5] F01N *3/02*, *3/06*
U.S. Cl. 181—231 7 Claims



1. A physical shape-conformable, disposable, self-sustaining

sound dampening unit for use on a noise-emitting vacuum motor having an air exhaust in the form of an airstream and adapted to attach to the air exhaust of said vacuum motor to dampen the noise produced by the vacuum motor, which comprises:

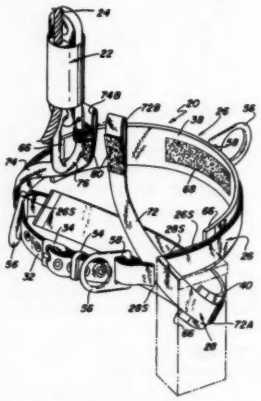
a body member formed of a thin imperforate film outer layer and a polymer acoustic foam inner layer lining interior surfaces of said body member, having an open inner cavity and at least one inlet port and at least one outlet port, the body having an unobstructed interior pathway between the inlet ports and the outlet port, said inlet and outlet ports being disposed so that an incoming airstream impinges on an interior acoustic foam covered wall of said body and is made to turn at a right angle to create an air flow scattering effect before reaching said outlet port, said body member being adapted to expand under pressure of said airstream to inflate and adapted to conform to external unyielding elements in contact with it.

5,067,585

MULTIPURPOSE SAFETY AND POSITIONING BELT

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976

Filed Aug. 17, 1990, Ser. No. 569,357
Int. Cl.[5] A62B *1/06, 35/00*
U.S. Cl. 182—7 **29 Claims**



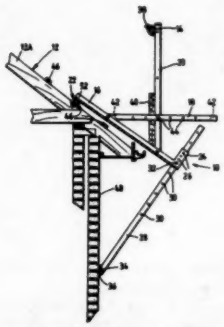
1. Safety apparatus to be worn by a person located at an elevated position for releasable securement to a fixed means located adjacent said position to protect the person from falling and/or suspend said person thereat, while enabling said person to move about relatively unencumbered by said apparatus and also enabling said person to connect said apparatus to a lowering device mounted on an adjacent safety line to repel down said line, said apparatus comprising first belt means, second belt means, and lowering device connection means, said first belt means being arranged to be releasably secured about the waist of the person and including first connection means for releasable securement to said lowering device, said second belt means comprising an elongated web-like member having a pair of ends, each of said ends being fixedly secured to said first belt means at respective spaced positions, said second belt means being disposed in a stowed position interposed between said first belt means and the lower portion of the back of said person, said second belt means being arranged to be pulled down and out from said first belt means to an extended position to form a seat for the buttocks of said person, said lowering device connecting means comprising a pair of extendable, elongated strap-like members being fixedly secured to one of said belt means at a respective positions thereon adjacent the person's hips, each of said strap-like members having a free end arranged to be readily connected to said lowering device for enabling said person to repel down on a safety line once said person has disconnected said first belt means from said holding device.

5,067,586

SAFETY GUARD APPARATUS

James H. Myers, 11 Downview Park, Greenisland, County Antrim BT38 8RY, Northern Ireland

Filed Apr. 17, 1990, Ser. No. 510,218
Int. Cl.[5] E04G *3/12*
U.S. Cl. 182—45 **15 Claims**



1. A safety guard apparatus comprising:

two or more units to be spaced apart on a pitched roof and secured together by a rail fastened to each unit, each unit having a first elongate member with a second and a third elongate member mounted in spaced relation thereon and pivotally connected thereto, said second and third members being interconnectible together, each first member having at one end fastening means by which the unit can be supported on a roof member with its second member serving as a tie for the third member which serves as an upright guard rail support;

said first members each having a tubular collar rigidly fixed thereto at an end opposite said fastening means with a tubular axis of said collar at a right angle to the first member; and

a fourth rigid elongate member engaged through and in sliding engagement with each said tubular collar, each said fourth member being positionally adjustable with respect to its collar such that a lower end thereof may abut a vertical wall below said pitched roof to support its respective unit above said roof.

5,067,587

SERVICE PLATFORM FOR MOBILE SCAFFOLDING UNIT

William F. Mims, Jr., 3805 Sandybrook Dr., Arlington, Tex. 76017; Richard T. Bramlett, Fort Worth, and Kenneth G. Oatman, Arlington, both of Tex., assignors to William F. Mims, Jr., Arlington, Tex.

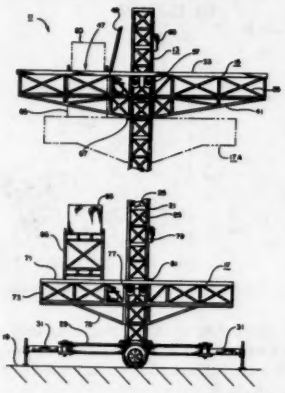
Filed Dec. 28, 1990, Ser. No. 635,852
Int. Cl.[5] E04G *1/20, 21/00*
U.S. Cl. 182—63 **6 Claims**

1. A mobile scaffolding unit, comprising:

(a) tower means adapted to be vertically oriented when on location at a worksite, said tower means having securing means for securing said tower means in place at said worksite;

b) a work platform mounted onto said tower means, said work platform having first motor means for moving said work platform along said tower means, said work platform having a deck that is adapted to support cargo and workers, said deck having hatch means therein for receiving cargo;

c) a service platform mounted onto said tower means at a location beneath said work platform, said service platform having second motor means for moving said service platform along said tower means, said service platform having



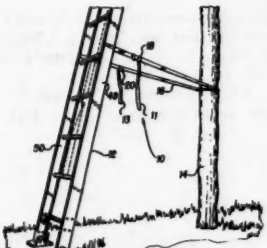
a deck adapted to support cargo, wherein said work platform can be resupplied by said service platform traversing said tower means and by loading cargo on said work platform through said hatch means from said service platform below.

5,067,588

LADDER LASH

Roy B. Bendickson, Greenville, Pa., assignor to R. D. Werner Co., Inc., Greenville, Pa.

Filed Apr. 9, 1990, Ser. No. 506,459
Int. Cl.[5] E06C *5/36*
U.S. Cl. 182—107 6 Claims



1. A system for holding a ladder in a secure position relative to an object against which the ladder rests comprising:

a strap that contacts the ladder and the object and secures the ladder to the object;

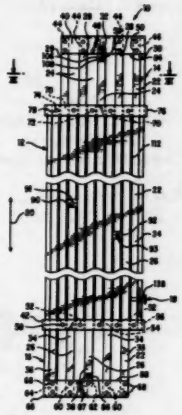
a first buckle and a second buckle with each buckle being able to be placed at a desired position on the strap, and each end of the strap passing through a respective buckle and positioned about a side rail of the ladder such that the strap can be tightened from the ladder by pulling each end of the strap that has passed through its respective buckle toward the ladder.

5,067,589

EXTENDABLE SUPPORT

Frederick J. Bartnicki, Greenville, Pa., assignor to R. D. Werner Co., Inc., Greenville, Pa.

Filed Jul. 31, 1990, Ser. No. 560,378
Int. Cl.[5] E04G *5/08*
U.S. Cl. 182—223 7 Claims



1. A support comprising:

a pair of support section movably engaged with each other;

a support surface defined by said support sections, movement of said support sections relative to each other causing adjustment to the size of said support surface;

a lock for releasably fixing the size of said support surface by releasably fixing the position of said support sections with respect to each other, said lock is movable to a locked position and an unlocked position such that in the locked position, the lock fixes the support sections relative to each other and in the unlocked position, the lock allows the support sections to move relative to each other to adjust the size of said support surface; and

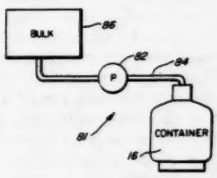
means to releasably secure the lock in an unlocked position.

5,067,590

METHOD FOR FILLING A PRESSURIZED LUBRICANT DISPENSING CHAMBER

James L. King, Sr.; James L. King, Jr., both of Rock Falls, and John Pope, Sterling, all of Ill., assignors to Sauk Valley Equipment Company, Rock Falls, Ill.

Division of Ser. No. 329,562, Mar. 28, 1989, Pat. No. 4,977,979.
This application Sep. 21, 1990, Ser. No. 586,191
Int. Cl.[5] F16N *13/22;* B65B *3/12*
U.S. Cl. 184—15.1 4 Claims



1. The method of dispensing lubricant from a refillable pressurized container, comprising:

(1) providing a container pressurized with gas;

(2) providing a pump having an inlet and a discharge outlet;

(3) providing a supply of lubricant;

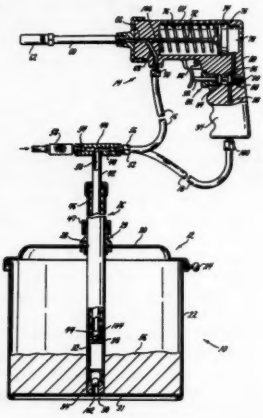
(4) connecting the pump inlet with said supply of lubricant;
(5) connecting said pump discharge outlet with said container;
(6) pumping lubricant from said supply into said container until the container is partially filled with lubricant and the back pressure in the container stalls the pump;
7) dispensing lubricant from the container under pressure of the gas therein; and
(8) repeating step (6) to refill said container before the lubricant in the container is exhausted.

5,067,591

COMBINATION AIR/MANUAL ECONOMY GREASE DISPENSER

Kenneth L. Fehlig, Chesterfield, Mo., assignor to Pentair, Incorporated, St. Paul, Minn.

Filed Nov. 9, 1989, Ser. No. 434,855
Int. Cl.[5] F16N *7/30*
U.S. Cl. 184—55.1 **18 Claims**



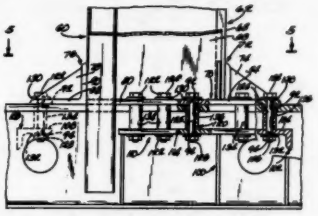
1. A fluid dispensing system comprising:
a self contained fluid pump adapted to be placed in fluid communication with a source of fluid, and adapted to both draw fluid from the source and deliver the fluid at a first pressure;
a first fluid communication means adapted to receive the fluid delivered by the fluid pump and to conduct flow of the fluid;
a second fluid communication means adapted to receive compressed air from a compressed air source and to conduct flow of the compressed air;
a fluid dispensing means adapted to receive fluid at the first pressure from the first fluid communication means and compressed air from the second fluid communication means and to selectively dispense a predetermined quantity of the fluid at a second pressure;
the fluid pump being a manually primed pump having a cylinder with a manually displaceable piston slidably received in the cylinder and a spring between the piston and cylinder, the piston being adapted to be manually displaced against the spring bias to a first position to draw fluid into the cylinder and prime the pump, and the piston being adapted to be displaced to a second position by the bias of the spring to force fluid drawn into the cylinder out of the cylinder and into the first fluid communication means.

5,067,592

MAST CONNECTING STRUCTURE

Stephen N. Miskin, Sandy, Utah, and Kurt M. Lloyd, Pewaukee, Wis., assignors to Harnischfeger Engineers, Inc., Brookfield, Wis.

Filed Sep. 22, 1989, Ser. No. 411,298
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—9 R **8 Claims**



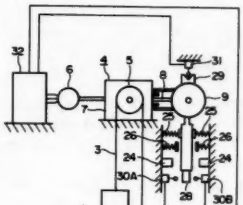
1. A mast connecting structure for mounting a mast on a base, the mast including a lower end and comprising:
upper plate means affixed to the mast lower end for holding the mast on the base;
lower plate means affixed to the base and spaced apart from the upper plate means for holding the mast on the base;
connecting means comprising a plurality of bolts each extending through and spanning the upper and lower plate means and the space between the upper and lower plate means for connecting the upper plate means and the lower plate means whereby the mast is mounted on the base, the connecting means having a tensioned condition tending to deflect the upper and lower plate means toward each other; and
support means positioned in the space between the upper plate means and the lower plate means and having a relatively rigid condition for preventing deflection of and holding said upper and lower plate means spaced apart against the tension of the connecting means whereby the tension applied to the connecting means is maintained.

5,067,593

BRAKING DEVICE FOR ELEVATOR WINDING MACHINE AND ELEVATOR USING THE BRAKING DEVICE

Masakatsu Tanaka; Masanobu Itoh; Noboru Arabori; Toshihiko Nara, all of Katsuta; Tastuhiko Takahashi, Ibaraki; Katutaro Masuda, and Mitsuo Saito, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,014
Claims priority, application Japan, Dec. 7, 1988, 63-307843
Int. Cl.[5] B66B *5/08*
U.S. Cl. 187—73 **23 Claims**



1. An elevator including a braking device comprising a

support member supporting a braking member of said brake device such that said braking member is displaceable to a limited extent in the rotating direction thereof, wherein said support member has means for resisting rotational displacement of said braking member with a nonlinear characteristic including a first range where the amount of resistance to displacement is small and a second range where the amount of resistance to displacement is large.

5,067,594

RESILIENT GUIDE FOR THE BRAKE HOUSING OF A FLOATING CALIPER SPOT-TYPE DISC BRAKE

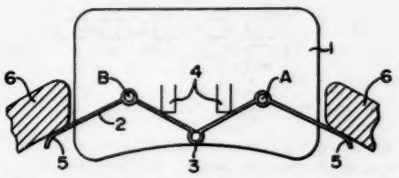
Hans-Dieter Leidecker, Frankfurt am Main; Bodo Schmidt, Lauterbach; Helmut Krause, Kelkheim, and Karl-Heinz Dobener, Eschenburg, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 495,249

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908741

Int. Cl.[5] F16D *65/02*

U.S. Cl. 188—73.35 10 Claims



1. A method for mounting a brake housing to a brake carrier of an automotive vehicle, said brake housing circumferentially extending between brake carrier arms about a wheel axle having an axle axis, said method comprising the steps of:

providing a circumferentially extending spring;

providing a circumferentially spaced apart attachment points on said brake housing;

providing projections on said brake housing between said attachment points and which project axially away from said brake housing;

mounting said spring onto said brake housing between end portions of the carrier arms and in an unloaded spring condition;

attaching said spring to said housing at said attachment points so that the circumferentially outer ends of said spring extend under the radially inwardly facing sides of said end portions of said carrier arms; and,

moving the central portion of said spring radially inwardly toward said wheel axle until portions of said spring located between said attachment points engage the radially inwardly facing portions of said projections to retain said spring in a loaded condition wherein the circumferentially outer ends resiliently engage said arms.

5,067,595

SPOT-TYPE DISC BRAKE

Rolf Weiler, Frankfurt am Main; Uwe Bach, Niedernhausen, and Ahmet D. Ceylan, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

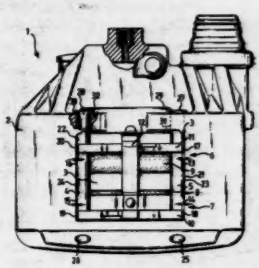
Filed Apr. 21, 1988, Ser. No. 184,220

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713948

Int. Cl.[5] F16D *65/02*

U.S. Cl. 188—73.45 8 Claims

1. A spot-type disc brake comprising, in combination: a brake caliper housing, two brake pad carriers held and guided in said housing by means of pins, wherein the pins are arranged in a fringe area of the pad carriers and are supported on and abut against side walls of an aperture in the brake caliper housing wherein said brake pad carriers are received, and wherein a predetermined gap is maintained between the respective ends of said brake pad carriers and the adjacent side wall apertures thereby to prevent corrosion therebetween.



5,067,596

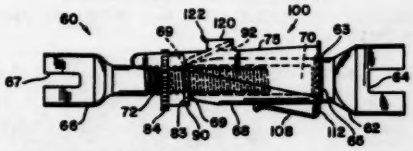
CLIP-ON AUTOMATIC ADJUSTER STRUT LEVER FOR A DRUM BRAKE

Donald D. Johannesen, South Bend, Ind., assignor to Allied Signal Inc., Morristown, N.J.

Filed Oct. 9, 1990, Ser. No. 594,584

Int. Cl.[5] F16D *51/00, 65/38*

U.S. Cl. 188—79.54 11 Claims



6. A drum brake having an automatically adjustable strut, the strut mounted adjacent brake application means disposed between two first ends of two brake shoes, the strut bearing against the brake shoes and having a device which automatically extends the length of the strut according to wear of the brake shoes, the device comprising a nut-and-bolt system operated by a strut lever mounted resiliently upon a body of the strut and having a pawl engaging teeth of the nut-and-bolt system, the pawl being moved, by means of a rocker lever mounted on the strut, in one direction relative to the strut when the brake returns toward an at-rest position after brake application, the rocker lever permiting the pawl to move in an opposite direction relative to the strut when the brake is applied, the strut lever further comprising a base member disposed at an angle to the pawl and having therein an opening receiving said body of the strut, the body of the strut including means for engaging a portion of said base member, a loading arm extending from said base member and engaging resiliently said body in order to provide a predetermined load upon said pawl, and a spring lever arm extending from said pawl and engaging said rocker lever, and means for positioning the strut lever circumferentially relative to the strut and disposed between the body and base member.

5,067,597

HUB AND EXCITER RING ASSEMBLY

Warren J. Young, 9 Becket St., Lake Oswego, Oreg. 97034

Filed Aug. 25, 1989, Ser. No. 398,709

Int. Cl.[5] B60T *8/32*

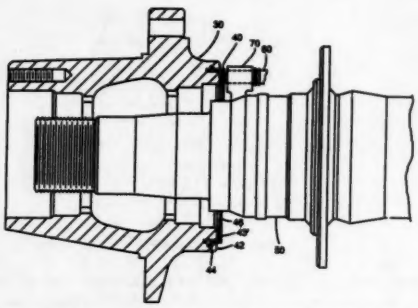
U.S. Cl. 188—181 R 11 Claims

1. A wheel hub assembly for use in an anti-lock brake application comprising:

a cast hub;

a ferrous exciter ring having a projecting wall cast integral

with the hub so as to embed the exciter ring projecting wall within the hub without precision machining to form



a strong integral cast hub assembly which virtually eliminates the possible loosening of the hub and exciter ring which can result in failure.

5,067,598

LOAD-SWITCHING OVERRUNNING CLUTCH

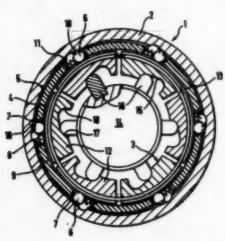
Joachim Ritter, Herzogenaurach, Fed. Rep. of Germany, and Harald Hochmuth, Emskirchen, Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 501,613

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911075

Int. Cl.[5] F16D *41/07*

U.S. Cl. 192—7 **18 Claims**



1. An overrunning clutch comprising clamping rings arranged concentrically one within the other and having mutually facing clamping paths between which clamping elements are arranged, one of said clamping rings comprising at least one axial slit to make it variable in diameter, said ring with variable diameter being acted upon by virtue of a wedge-surface effect by a switching member arranged equiaxially with it, so that a rotation of the switching member relative to the clamping ring with variable diameter causes a change in the distance between the clamping paths, said clamping ring with variable diameter being pre-tensioned by at least one spring to oppose the change in distance between the clamping paths which can be effected by the switching member, characterized in that the clamping elements and the clamping paths are so designed that a rotation of the clamping paths relative to each other in at least one direction of rotation effects a clamping of the clamping elements between the clamping paths by virtue of a wedge effect, the clamping elements being pre-tensioned in said direction of rotation, designated as clamping direction, by a spring, the clamping ring with variable diameter being formed of several segments radially moveable independently of each other, the segments being mounted at the switching member so as to be able to swivel through a certain angle and in each end region of the angle of swivel, a stop is provided which assures an interlocking entrainment of the segments by the switching member in the respective direction of rotation.

5,067,599

ARRANGEMENT FOR CONTROLLING A MOTOR FRICTION CLUTCH

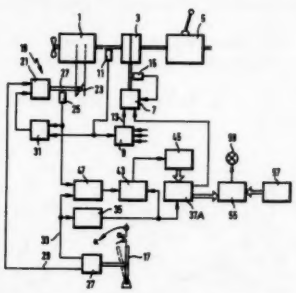
Manfred Röder, and Andreas Konrad, both of Untereuerheim, Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 2, 1990, Ser. No. 547,620

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922315

Int. Cl.[5] B60K *41/02*

U.S. Cl. 192—0.32 **9 Claims**



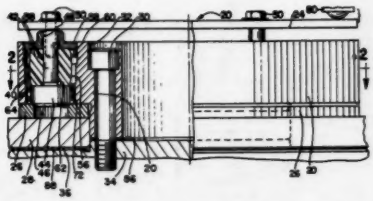
1. An arrangement for controlling a friction clutch (3) being operated by an actuating drive (7) and being part of a motor vehicle in which an internal combustion engine (1) comprises an output setting device (19) which can be controlled by means of an accelerator pedal (17) but which cannot be influenced by the pedal (17) in a limited initial pedal travel (α_o) which follows on from an inoperative position of the pedal (17), and comprising a pedal position sensor (27) which generates a pedal position signal representing the actual position of the accelerator pedal (17) within the initial pedal travel (α_o), and comprising a control arrangement (35, 37) which as a function of the pedal position signal generates a clutch position signal for controlling the actuating drive (7) which adjusts the actuating drive (7) to a clutch position transmitting torque and associated with the actual position of the accelerator pedal (17) the clutch position falling between a completely disengaged position and a completely engaged position of the friction clutch (3), wherein first control means (35) of the control arrangement which establishes a predetermined first signal characteristic generate a desired torque signal dependent upon the pedal position signal and the first signal characteristic and wherein second control means (37) of the control arrangement which establishes a predetermined second signal characteristic generate the clutch position signal which controls the actuating drive (7) as a function of the desired torque signal and the second signal characteristic, and wherein a correction means (43, 45, 47) in the position of the friction clutch which is established by the clutch position signal generates an actual torque signal representing the torque of the internal combustion engine (1) at any given moment, comparing it with the desired torque signal and wherein correction means (43, 45, 47) determines at least one correction value for correction of the torque-dependent pattern of the values of the clutch position signal which are established by the second signal characteristic of the second control part (37), and wherein if there is a deviation of the actual torque signal from the desired torque signal, the correction means (43, 45, 47) alters the second signal characteristic established by the second control means (37) by an appropriately directed addition of the correction value to the torque-dependent pattern of the clutch position of the second signal characteristic for subsequent controlling of the actuating drive (7).

5,067,600

PRECISION OVERLOAD CLUTCH APPARATUS FOR AUTOMATED MACHINERY

Frank H. Koller, Norridge, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 13, 1991, Ser. No. 654,600
Int. Cl.[5] F16D 7/02
U.S. Cl. 192—56 R 17 Claims



1. In an overload clutch of the type including a drive plate having a plurality of detent receiving openings, a clutch body portion, a plurality of plunger detent members slidably mounted in plunger openings formed in the clutch body portion, each detent member having a head portion, and springs elements respectively biasing the plunger detent member towards said drive plate so that the plunger detent head portions are normally respectively seated in the detent receiving openings, the improvement comprising:

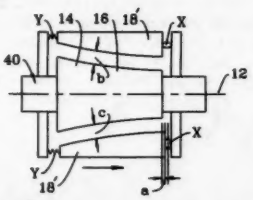
bearing means journaled within each respective opening formed in the clutch body portion and mounted about the head portion of each plunger detent member to minimize unwanted backlash movement of said detent head portion relative to the drive plate when said head portion is normally seated in the associated plunger receiving opening thereof.

5,067,601

CLUTCHES

Rudolf R. Castens, Romostar Corporation N.V. Centro Comercial Antilia No. 18, P.O. Box 3429, Curacao, Spain

Continuation of Ser. No. 112,638, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 16,458, Feb. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 821,453, Jan. 22, 1986, abandoned. This application Oct. 3, 1989, Ser. No. 418,795
Int. Cl.[5] F16D 11/00
U.S. Cl. 192—65 14 Claims



1. A positive axial clutch including a first member having a surface of revolution about the axis of rotation of the clutch, which surface is derived from a hyperboloid, a second member defining with the first member an annular space between confronting surfaces of the members, one of which is said surface of revolution, and a plurality of thrust transmitting rollers disposed in said annular space so as to engage with the surfaces to make thrust transmitting contact between confronting surfaces for driven rotation of said first or second member in at least one direction, said rollers each having a longitudinal rolling central axis, said hyperboloid from which said surfaces are derived being generated by using said central axis of said rollers as the straight line generators thereof, each roller contacting said surface of revolution of said first member along a generator of said surface or a line which approximates to such a generator, the rollers all being similarly inclined with respect to radial planes, means at an interface between at least one end portion of each of said rollers and at least one of said first and second members to permit slidable movement therebetween at least in a first direction while supporting the rollers axially thereof;

wherein the surfaces approximate generally conical hyperboloidal surfaces having a diameter at one end portion of each member greater than the diameter at the other end portion of the same member;

wherein said means at the interface between said rollers and at least one of said first and second members in an annular support member positioned on and supported by at least one of said members beneath said rollers at the portion of contact of said rollers with said surfaces corresponding to the larger diameter end of each member;

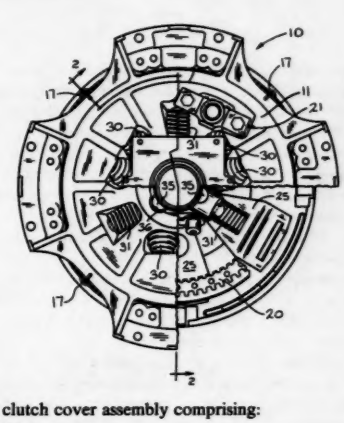
wherein said annular support member is capable of slidable rotation relative to at least one of said members so as to freely support said rollers rotatably relative to at least one of said members.

5,067,602

INTERNALLY ASSISTED CLUTCH

Richard A. Flotow, Butler, and Gordon W. Denton, Ft. Wayne, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed May 14, 1990, Ser. No. 523,068
Int. Cl.[5] F16D 13/50, 13/54
U.S. Cl. 192—70.27 9 Claims



1. A clutch cover assembly comprising:

a cover;

a pressure plate;

means for connecting said pressure plate to said cover for rotation therewith and for axial movement relative thereto between engaged and disengaged positions relative to said cover;

means for selectively moving said pressure plate between said engaged and disengaged positions;

first resilient means extending between said cover and said means for selectively moving said pressure plate for exerting a relatively large force to urge said pressure plate towards said engaged position;

second resilient means extending between said cover and said means for selectively moving said pressure plate for exerting a relatively small force to urge said pressure plate toward said disengaged position; and

means formed on said cover and said means for selectively moving said pressure plate for preventing excessive relative rotation therebetween, said means for preventing excessive relative rotation including a recess formed in

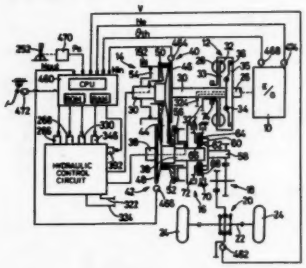
said cover and a protrusion formed on said means for selectively connecting, said protrusion extending into said recess and engaging said cover when a predetermined amount of relative rotation occurs therebetween.

5,067,603

APPARATUS FOR CONTROLLING HYDRAULICALLY OPERATED CLUTCH IN VEHICLE TRANSMISSION SYSTEM, INCLUDING TWO VALVES FOR ENGAGING AND DISENGAGING THE CLUTCH

Nobuyuki Kato, Toyota; Ryoji Habuchi, Aichi; Kunio Morisawa, and Hiroshi Itoh, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 31, 1990, Ser. No. 560,829
Claims priority, application Japan, Aug. 9, 1989, 1-206085
Int. Cl.[5] B60K *41/02*
U.S. Cl. 192—0.076 9 Claims



1. A hydraulic control apparatus for controlling a hydraulically operated clutch in a power transmitting system for an automotive vehicle, wherein the clutch is placed in an engaged position by feeding a pressurized fluid supplied from a hydraulic power source into an engaging chamber of the clutch while discharging the fluid from a releasing chamber of the clutch into a drain, and the clutch is placed in a released position by feeding the fluid into the releasing chamber while discharging the fluid from the engaging chamber, said hydraulic control apparatus comprising:

a two-position clutch control valve having a first position and a second position;

a two-position rapid clutch release valve having a third position and a fourth position;

first fluid passage means formed when said clutch control valve and said rapid clutch release valve are placed in said first and third positions, respectively, for feeding said pressurized fluid from said hydraulic pressure source into said releasing chamber of said clutch while discharging the fluid from said engaging chamber of said clutch into said drain, for releasing said clutch at a normal speed;

second fluid passage means formed when said clutch control valve and said rapid clutch release valve are placed in said second and third positions, respectively, for feeding said pressurized fluid into said engaging chamber while discharging the fluid from said releasing chamber to said drain, for engaging the clutch; and

third fluid passage means formed when said clutch control valve and said rapid clutch release valve are placed in said second and fourth positions, respectively, for feeding said pressurized fluid into said releasing chamber while discharging the fluid from said engaging chamber to said drain, for releasing said clutch at said normal speed,

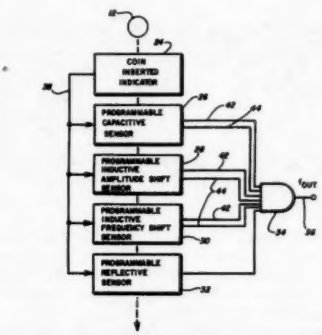
whereby said clutch may be released at normal speed when said clutch control valve and said rapid clutch release valve are in either of the first and third positions or the second and fourth positions, respectively.

5,067,604

SELF TEACHING COIN DISCRIMINATOR

Stanley M. Metcalf, Western Springs, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Nov. 14, 1988, Ser. No. 269,526
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—203 11 Claims



1. A programmable coin sensor apparatus comprising:

detector means for generating an analog detector signal representative of an inherent characteristic of a coin;

first storage means for storing a digital upper limit signal;

second storage means for storing a digital lower limit signal;

first digital to analog means operatively connected to said first storage means for converting said digital upper limit signal to an analog upper limit signal;

second digital to analog means operatively connected to said second storage means for converting said digital lower limit signal to an analog lower limit signal;

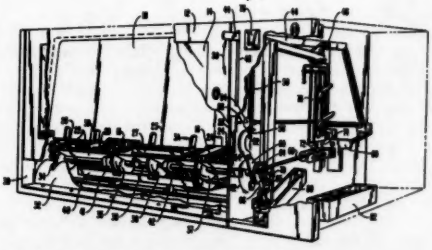
comparator means operatively connected to said detector means, and said first and second digital to analog means for generating an accept signal if said analog detector signal is between said upper analog limit signal and said lower analog limit signal.

5,067,605

SINGLE PAPER DISPENSER

Roger G. Gordon, Richmond, Calif., assignor to Unirac Corp., Richmond, Calif.

Continuation of Ser. No. 327,367, Mar. 22, 1989, abandoned, which is a continuation of Ser. No. 185,254, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 877,917, Jun. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 789,343, Oct. 16, 1985, Pat. No. 4,667,803, which is a continuation of Ser. No. 598,646, Apr. 10, 1984, abandoned. This application Jul. 19, 1990, Ser. No. 559,529
Int. Cl.[5] G07F *11/40*
U.S. Cl. 194—248 16 Claims



15. A single paper dispenser comprising:

an enclosure having a transverse aperture at one end and a

discontinuous transverse member proximate the transverse aperture;

conveyor means for the stack of papers including a horizontal belt adapted to support the papers at their lower edges, a backplate fixed to and extending upwardly from the belt to support the papers in a generally vertical position, and means for biasing the belt toward said end of the enclosure to bias the stack of papers against said transverse member;

brake means operable to prevent movement of the belt;

cam means including a cam shaft rotatable about an axis parallel to the transverse aperture, a plurality of dispensing cam elements fixed to the cam shaft and having tongue means movable upwardly through the discontinuities in the transverse member and then forwardly relative to the transverse member upon rotation of the cam means, and brake cam means fixed to the cam shaft and engageable with the brake means to prevent movement of the belt upon rotation of the cam means;

means for rotating the cam shaft to engage the forwardmost paper in the stack with the tongue means while the remainder of the stack is immobilized to lift and separate the forwardmost paper from the remainder of the stack and drop the separated paper past the transverse member to the transverse aperture; and

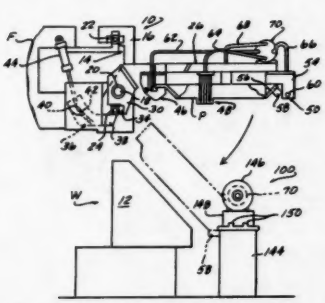
an antitheft plate secured to the cam shaft to inhibit access by hand to the papers through the transverse slot.

5,067,606

CLAMP ACTUATING SYSTEM FOR A CONVEYOR CARRIED CLAMPING FRAME

Howard M. Schlatter, Rochester Hills, and Lawrence A. Wisne, Farmington Hills, both of Mich., assignors to Progressive Tool & Industries Co., Southfield, Mich.

Filed Jan. 18, 1991, Ser. No. 643,533
Int. Cl.[5] B65G *29/00*
U.S. Cl. 198—465.1 **20 Claims**



1. In a workpiece handling system comprising a clamping frame, a plurality of releasable clamps mounted on said frame and operable to clamp a workpiece in a predetermined position upon said frame, power operable clamp actuating means for selectively locating said clamps in either of a workpiece clamping position or a workpiece release position accommodating movement of a workpiece to or from said predetermined position on said frame, and transfer means for transferring said frame along a transfer path extending from a workpiece loading station to a workpiece unloading station;

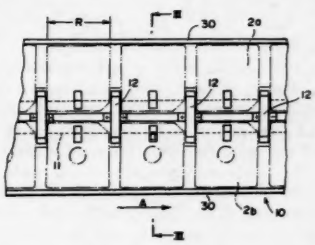
the improvement wherein said clamp actuating means comprises a plurality of elongate flexible push/pull cable means having first ends respectively coupled to said plurality of clamps for shifting said clamps from one of said clamping and release positions to the other of said clamping and release positions in response to pushing of said cable means and for shifting said clamps from said other of said positions to said one of said positions in response to pulling of said cable means, a common actuating means mounted on said frame and including an actuator member mounted for reciprocating movement along a fixed path relative to said frame and coupled to the respective other ends of said plurality of cable means to push said cable means in response to movement of said actuator member in one direction along said fixed path and to pull said cable means in response to movement of said actuator member in the other direction along said fixed path, screw means on said actuating means operable when rotated to drive said actuator member in movement along said fixed path, and reversible power drive means at each of said loading and unloading stations selectively engageable with said screw means to drive said screw means in rotation.

5,067,607

INTERMITTENT FEED SYSTEM

Akira Mizuta, and Kazumi Kitamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1990, Ser. No. 599,167
Claims priority, application Japan, Oct. 18, 1989, 1-270739
Int. Cl.[5] B65G *19/08*
U.S. Cl. 198—733 **2 Claims**



1. An intermittent feed system for intermittently feeding a plurality of works in two rows in a predetermined direction, comprising:

a pair of guide rails which extend in the predetermined direction in parallel to each other and spaced from each other in the direction of their widths,

a single endless belt which is disposed below the space between the guide rails and extends in the predetermined direction, and

a plurality of attachments fixed to the endless belt at regular intervals to move together with the endless belt in the predetermined direction, each attachment comprising a vertical base portion which projects upward through the space between the guide rails and a pair of arm portions which transversely project in opposite directions above the respective guide rails so that when the endless belt moves in the predetermined direction, each arm portion pushes the work placed on the corresponding guide rail in the predetermined direction along the guide rail wherein each of said attachments is fixed to the endless belt by way of a profile which is fixed to the endless belt and is provided with a horizontal through hole, and said base portion of the attachment has a pair of leg portions which are spaced from each other and are provided with through holes extending horizontally in alignment with each other, the base portion being positioned on the endless belt so that the leg portions are on opposite sides of the profile with the through holes of the leg portions and the profile in alignment with each other and fixed to the profile by means of a pin member which is inserted into the through holes, the distance between the through holes of the leg portions and the lower surface of the leg portions being slightly larger than the distance between the through hole of the profile and the upper surface of the endless belt so that the leg portions are pressed against the endless belt when the pin member is inserted into the through holes.

5,067,608

IMPROVEMENTS IN OR RELATING TO LOADING AND UNLOADING APPARATUS

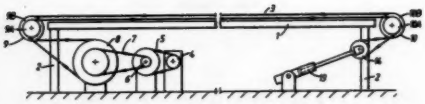
William McLellan, Stirling, Scotland, assignor to Automatic Truck Loading Systems (Europe) Ltd. and Bridon plc, Doncaster, England

Filed Apr. 9, 1990, Ser. No. 506,161

Claims priority, application United Kingdom, Apr. 14, 1989, 8908430

Int. Cl.[5] B65G *15/10*

U.S. Cl. 198—817 20 Claims



1. A load transfer apparatus comprising flexible elements forming a plurality of closed elongated loops, driving means for propelling each loop, each of the loops having a conveying portion and a return portion forming a conveying path, first and second idler pulley systems, both systems having first and second pulleys for the conveying portion and return portion of each loop, the first pulleys having a diameter different from a diameter of the second pulleys and the first and second pulleys being at each end of the conveying path and having a common axes of rotation, a load platform over which the conveying and return portions of each loop pass in opposite directions, and guide support means for separating the conveying portion of the loop from the return portion of the loop, both portions being positioned above the axes of the first and second pulleys and for supporting the conveying portion of at least one loop in contact with a load.

5,067,609

PACKAGING AND DISPLAY CASE FOR DISSIMILAR OBJECTS

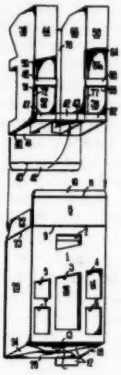
James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 1, 1990, Ser. No. 591,291

Int. Cl.[5] B65D *5/50*

U.S. Cl. 206—45.11 11 Claims

1. A case for packaging and displaying a plurality of dissimilar objects said case comprising an outer sleeve having front, back and side walls interconnected to form a tubular structure and including top and bottom closure elements, a first pair of object viewing windows formed in said front wall, an inner sleeve having back and side walls and arranged for telescopic insertion into said outer sleeve, a pair of spaced apart compartments formed within said inner sleeve and arranged respectively adjacent said side walls of said outer sleeve and defining a vertical medial cavity therebetween, the width of said compartments from side to side being somewhat less than the dimension of said compartments from front to rear, a spacer panel foldably joined along a first vertical fold line to each of said sidewalls, an anchoring panel secured in face contacting relation to the adjacent wall of said medial cavity and foldably joined to each of said spacer panels along a second vertical fold line which defines an edge of each of said spacer panels which is remote from each of said first vertical fold lines so as to afford a pair of compartments of desired quadrilateral horizontal cross section and of small horizontal dimensions than said medial cavity and a second pair of object viewing windows



formed respectively in said compartments and arranged in general coincidence with said first pair of viewing windows.

5,067,610

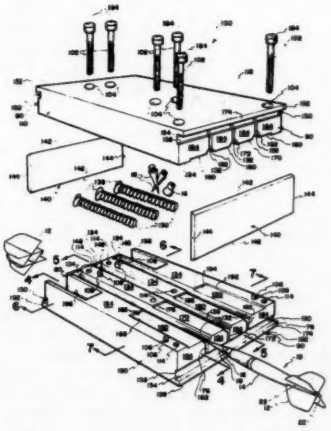
DART STORAGE AND TRANSPORT APPARATUS

Edward A. Jensen, 5936 S. Blue Iron Way, Kearns, Utah 84118

Filed Apr. 3, 1991, Ser. No. 679,878

Int. Cl.[5] B65D *85/20*

U.S. Cl. 206—315.1 20 Claims



1. A carrier is storage and transport of at least one dart and parts of darts comprising:

means for housing at least one dart and dart parts;

means within the housing for maintaining separation between each dart and dart parts when at least one dart and dart parts are stored therein;

means for retaining the at least one dart and dart parts within the housing during storage or transport;

means for compressibly receiving and storing dart insertion energy and for, thereby, providing energy for partial ejection of the dart upon release from retention by the dart retaining means.

5,067,611

BLISTER PACK FOR STORAGE OF NEEDLES AND THE LIKE

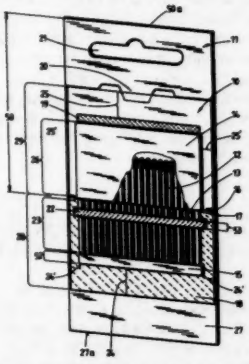
Paul Hagmann, and Hermann Greven, both of Stolberg, Fed. Rep. of Germany, assignors to William Prym-Werke GmbH & Co. KG, Stolberg, Fed. Rep. of Germany

Filed Jun. 7, 1990, Ser. No. 534,739

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1989, 8907589[U]

Int. Cl.[5] B65D *85/24, 73/00*

U.S. Cl. 206—383 **24 Claims**



1. A pack for small articles, such as notions, particularly for arrays of parallel needles and analogous elongated articles, comprising a substantially plate-like carrier member having first and second sections and a substantially straight first weakened portion between said sections; and a substantially plate-like cover member having first and second sections respectively adjacent the first and second sections of said carrier member, at least one of said second sections having a plurality of article-receiving pockets with open first ends adjacent and second ends remote from said weakened portion, said second sections having coherent portions together forming a substantially U-shaped frame which surrounds said pockets and has free ends adjacent said weakened portion, said cover member having a second weakened portion between said first and second sections thereof and said first sections having portions separably connected to each other so that said first sections can be pivoted away from each other along the respective weakened portions to expose the open first ends of said pockets upon termination of separable connection between said portions thereof.

5,067,612

SHRINK FILM PACKAGE HAVING PERFORATED FOLDED STRIP

Mikio Tsuchiya, Chiba; Shoichi Kawase, and Hirofumi Watanabe, both of Tokyo, all of Japan, assignors to Honshu Sangyou Kabushiki Kaisha and Honshu Paper Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 470,266, Jan. 25, 1990, abandoned. This application Jan. 2, 1991, Ser. No. 645,331

Claims priority, application Japan, Jan. 26, 1989, 1-15163; Jan. 5, 1990, 2-118

Int. Cl.[5] B65D *65/28, 71/08*

U.S. Cl. 206—497 **8 Claims**

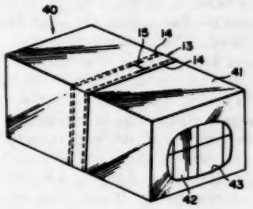
1. A shrinking film package having a tape-shaped tear-off portion comprising:

at least one article;

a heat-shrinkable film tightly wrapped around at least part of said at least one article;

a longitudinal pleat in said film forming a folded strip of three layers of overlapping film;

two substantially parallel lines of perforations extending along at least part of said strip of overlapping film; and



said three layers of overlapping film being at least partially welded together so that said perforations and three layers of overlapping film provide a tape-shaped tear-off strip between said lines of perforation.

5,067,613

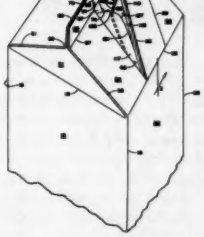
GABLE TOP CARTON WITH INTERIORLY STORED RECLOSABLE SPOUT

William T. Bryan, 927 Garnoa Dr., Cincinnati, Ohio 45231

Filed May 13, 1991, Ser. No. 699,219

Int. Cl.[5] B65D *5/70, 5/74*

U.S. Cl. 229—214 **19 Claims**



1. A reclosable gable top carton comprising a bottom wall, an upstanding side wall connected to and extending from said bottom wall and a gable top connected to and extending from portions of the side wall opposite the bottom wall of the carton, said gable top comprising:

a pair of opposed converging rectangular roof panels connected to and extending from opposed top portions of the upstanding side wall, a pair of opposed triangular top panels articulated to opposed top portions of said side wall, opposed pairs of top fold panels respectively articulated to and extending between one of said rectangular roof panels and a corresponding one of said triangular top panels, respective top seal panels connected to each rectangular roof panel and top fold panel and extending to an edge remote from said respective panel, the top seal panels joined in a ridge seam extending upwardly from the roof panels, a selected one of said rectangular roof panels and respective top seal panel connected thereto being provided with lines of weakening defining a pouring spout flap extending from the upstanding side wall to the top edge of the top seal panel and swingable about the top of the upstanding side wall when the lines of weakening are severed, portions of the top fold panels articulated to said selected roof panel underlying the pouring spout flap adjacent the ridge seam,

a spout web member having a central portion attached to an inner face of the pouring spout flap, web accordian pleat panels articulated to the central panel along fold lines

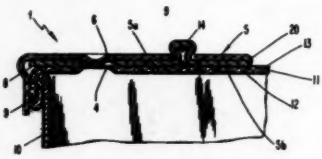
defining opposite respective sides of said central panel, a bottom glue panel articulated to said central panel and outer glue panels articulated to said web accordian pleat panels and attached to an inner face of the respective roof panel adjacent but spaced from the spout flap, the pouring spout flap swinging between closed position in which the pouring spout flap is aligned with said roof panel and top seal panel, an open position in which the accordian pleat panels are extended, a past closed position in engagement with said underlying portions of triangular top fold panels and to closed position aligned with the adjacent roof and top seal panel portions whereby a sealed gable top carton is provided having a pouring spout which may be opened, reclosed and resealed by finger pressure on the spout while the carton is shaken to mix the carton contents.

5,067,614

PACKING CONTAINER PROVIDED WITH OPENING ARRANGEMENT

Tommy Jönsson, Malmö Sweden, assignor to Tetra Pak Holdings S.A., Pully, Switzerland

Filed Feb. 22, 1990, Ser. No. 483,115
Claims priority, application Sweden, Mar. 7, 1989, 8900792
Int. Cl.[5] B65D *77/30*
U.S. Cl. 229—123.1 **10 Claims**



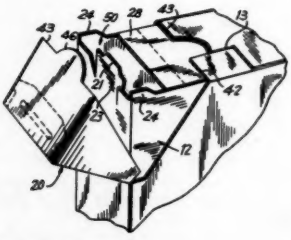
1. A packing container formed at least partly by a wall having an outside surface and an opening arrangement for removing the contents of the container through an opening in the wall, said opening arrangement comprising: upper and lower strips, said lower strip being secured to said outside surface adjacent said opening, said upper strip being arranged in overlapping relation with said lower strip and having a hole formed therein, and said lower strip having a protruding part arranged to protrude through said hole, said upper strip overlapping said lower strip and covering said opening when said protruding part protrudes through said hole whereby said opening arrangement allows reclosing of the container, said lower strip being hinged to said upper strip at a location spaced from said protruding part.

5,067,615

RECLOSABLE BOX AND BLANK THEREFOR

Edward Davitian, 420 E. 55th St., New York, N.Y. 10021

Filed May 11, 1990, Ser. No. 522,270
Int. Cl.[5] B65D *5/54*
U.S. Cl. 229—230 **20 Claims**



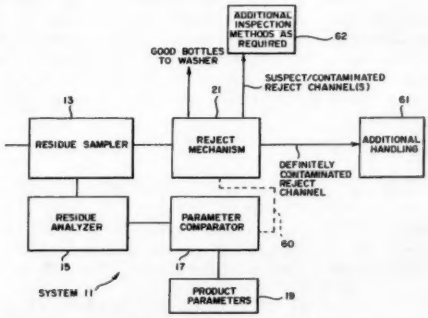
1. A reclosable box comprising:
four side panels, a bottom flap and a top flap; and
a reclosable closure formed of portions of three of the side panels and the top flap;
the reclosable closure comprising an orthogonal hinge line on a first one of the side panels and a cut line on each of a second and third ones of the side panels adjacent to the first one of the side panels, the cut lines on the second and third side panels terminating at an edge adjacent to the hinge line, and a cut line on the top flap, the cut line on the top flap terminating at edges adjacent to the cut lines on the second and third side panels, the cut lines being chosen from the group consisting of perforated cut lines and continuous cut lines; and
an additional section affixed to an inside portion of the first, second and third side panels;
the reclosable box having resilient biasing means for holding the reclosable closure in a open position until pulled to a closed position, the resilient biasing means comprising a tap portion formed in the hinge line and a spring portion cut in the additional section, the tab portion biasing the spring portion of the additional section when the reclosable closure is hingedly moved.

5,067,616

METHODS OF DISCRIMINATING BETWEEN CONTAMINATED AND UNCONTAMINATED CONTAINERS

George Plester, Essen, Fed. Rep. of Germany; Warren E. Leddon, Dunwoody, and David E. Dalsis, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 76,735, Jul. 23, 1987, Pat. No. 4,830,192, which is a continuation-in-part of Ser. No. 892,983, Aug. 4, 1986, Pat. No. 4,858,768. This application May 15, 1989, Ser. No. 351,994
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] B07C *5/02, 5/342;* G01N *21/90, 35/06*
U.S. Cl. 209—3.1 **32 Claims**



1. A method for discriminating between a contaminated and an uncontaminated container from a population of containers which were once filled with product to be consumed, each of said containers having a residue therein comprising the steps of:
generating a reference range representative of at least one physical response generated by samples of a product residue utilizing a first method of detection;
generating at least one physical response from a residue in each container utilizing the first method of detection;
comparing the physical response of the sample residue with

the reference range representative of the physical response of product residue;

rejecting the container when the physical response of the sample residue does not correlate to the physical response of the product residue;

classifying the rejected containers into definitely rejected containers and suspect containers having an overlapping signal characteristic of product residue; and

reinspecting the suspect containers utilizing at least one additional method of detection to accept or reject the suspect containers by generating an additional physical response from residue in said suspect containers;

whereby complex analytical systems for detecting a large number of unknown contaminants is avoided by reducing the analytical problem to the detection of known and relatively few product residues whose presence is used to indicate that the container was not contaminated.

5,067,617

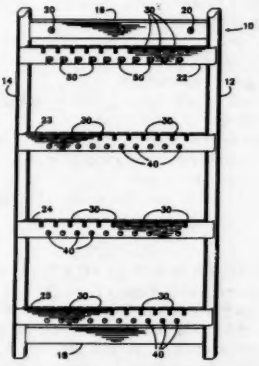
EARRING STORAGE AND DISPLAY RACK

Dean Caldwell, 4524 SE. Naef Rd., Milwaukie, Oreg. 97267, and Ginny Bass, 2707 SE. 35th Pl., Portland, Oreg. 97202

Filed Sep. 28, 1990, Ser. No. 590,154

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—13 **17 Claims**



1. An earring rack of the type adapted for mounting on a Vertical surface and having a framework of spaced apart vertical members with at least two horizontally disposed cross members attached to the vertical members and extending therebetween, and apertures in at least one of the cross members for storing earrings, the improvement comprising:

a downwardly extending slotted aperture through one of the cross members formed by a kerf opening at a lower edge of the one cross member and a hole through the one cross member; the hole having a peripheral edge intersected by the kerf at a point on the peripheral edge above a lowest point of the peripheral edge of the hole, whereby an arcuate saddle is defined along a lower edge of the hole with ingress to and egress from the hole provided through the kerf.

5,067,618

LAUNDRY ORGANIZER APPARATUS

Leinani Johnson, 627 Anela Pl., Wailuku, Hi. 96793

Filed Nov. 29, 1990, Ser. No. 619,603

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—13 **1 Claim**

1. A laundry organizer apparatus comprising,

a flexible support plate member, the plate member defined by a continuous arcuate perimeter edge, the perimeter edge including a bottom edge portion, and a bottom edge portion including a series of equally spaced apertures directed through the support plate member adjacent the bottom edge portion, and each of the apertures includes a securement fastener pivotally mounted thereon, and

wherein each securement fastener includes a "U" shaped clip, the "U" shaped clip including a first leg mounted to and arranged in a spaced relationship to a second leg, the second leg spring biased relative to the first leg, each securement fastener further including a clasp body, the clasp body mounted to the first leg, with the second leg selectively securable to the clasp body to define a continuous loop, wherein the first and second leg define a first plane, and the support plate defines a second plane, wherein the first plane is arranged generally orthogonally relative to the second plane, and

wherein the plate member includes a first plate side and a second plate side, the first plate side includes a first magnetic member mounted thereto, and the second plate side includes a second magnetic member mounted to the sec-

ond plate side, wherein the first and second magnetic members are coaxially aligned relative to one another to permit securement of one of the magnetic members to an interior drum of an associated laundry device, and

wherein the first magnetic member is defined by a predetermined first width, the second magnetic member is defined by a predetermined second width, and the plate member is defined by a predetermined plate width, and including a threaded fastener defined by a predetermined length substantially equally to the first width, the second width, and the plate width, and wherein the first magnetic member includes a first bore, the second magnetic member includes a threaded second bore, wherein the threaded fastener is positioned through the first bore, the plate member and the second bore securement of the magnetic members to the plate member, and

wherein the magnetic members are of a cylindrical configuration to minimize engagement with laundry garments during a laundry procedure.

5,067,619

BUILT-UP CUP RACK

Chih-Cheng Wu, 3F., No. 568-2, Chingping Rd., Chung-Ho City, Taipei Hsien, Taiwan

Filed Jan. 18, 1991, Ser. No. 643,242

Int. Cl.[5] A47G *29/00*

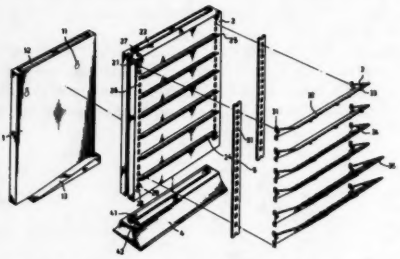
U.S. Cl. 211—71 **3 Claims**

1. A built-up cup rack, comprising:

a cover board in rectangular shape having a flat surface portion at the front, a recessed surface portion at the back and a four side edges around the periphery thereof, two elongated grooves made on two adjacent side edges thereof, two raised strips made on the other two adjacent side edges thereof, two projecting portions on said recessed surface portion at two opposite ends, a plurality of elongated slots transversely piercing through said flat surface portion and spaced from one another at equal

interval, a plurality of retaining holes longitudinally disposed on said flat surface portion at two opposite sides, a plurality of guide plates respectively obliquely disposed at the bottom edge of said elongated slots, a drain hole at the bottom;

a wall mounting board fastened in said recessed back side, having nail mounting holes on the back side thereof for mounting said cover board on a wall surface, two elongated grooves respectively made on the top and bottom ends thereof for fastening said two projecting portions of



said cover board, and a bevel board projecting from the bottom end thereof at one side for guiding water coming from said elongated slots to said drain hole for drainage; and

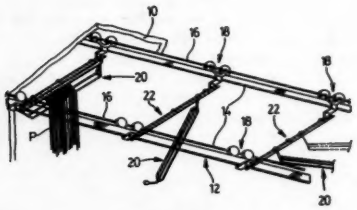
a plurality of hod-like cup holders mounted on said flat surface portion and respectively supported by said guide plates for holding cups, having each two retainers at two opposite ends and respectively fastened in said retaining holes, and a plurality of reinforcing stripes at the bottom to reinforce the strength of the structure.

5,067,620

PRODUCT SUPPORT APPARATUS

Lyle W. Norrie, 24 Stoneglen Drive, Etobicoke, Ontario, Canada

Filed Sep. 17, 1990, Ser. No. 583,206
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—113 **10 Claims**



1. A product support apparatus for supporting products on a conveyor system during processing, and comprising:

a hanger assembly upon which said products may be placed, said assembly defining two ends, and having arm portions, and abutment means, at each said end;

support bar means for said hanger assembly, said support bar means, in turn, comprising a pair of parallel rod members defining two ends and supported side-by-side and spaced apart a predetermined spacing and defining an elongated slot therebetween adapted to receive said arm portions;

junction means extending between said rod members clear of said slot;

connection means secured to said rod members for connecting same to a said conveyor system, and,

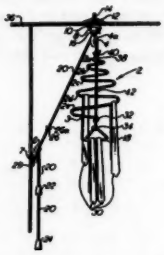
check means at each said end of said rod members engageable by said abutment means whereby to restrict sliding movement thereof along said rod members.

5,067,621

MULTI-LEVEL SUSPENDED GARMENT HOLDER

Elmore Alexander, 5024-D Strawberry Hill Dr., Charlotte, N.C. 28211

Continuation-in-part of Ser. No. 120,588, Nov. 13, 1987, abandoned. This application Jun. 16, 1989, Ser. No. 367,543
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—117 **13 Claims**



1. An improved garment holder for holding articles of clothing in a hanging position, comprising:

a coil member,

a vertically oriented torsion bar member attached to and extending through said coil,

a tail stabilizer article hanging bracket member attached to the bottom end of torsion bar,

a suspension eye member fixed to the top of said torsion bar,

ceiling hoist and suspension means for raising and lowering said garment holder, and

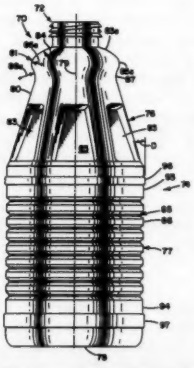
means for fixing said garment holder at variable elevations.

5,067,622

PET CONTAINER FOR HOT FILLED APPLICATIONS

Lawrence E. Garver, and Gregory L. Kimbrough, both of Columbia, S.C., assignors to Van Dorn Company, Cleveland, Ohio

Division of Ser. No. 435,688, Nov. 13, 1989, which is a continuation-in-part of Ser. No. 310,779, Feb. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 269,881, Nov. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 2,165, Jan. 12, 1987, abandoned. This application Oct. 1, 1990, Ser. No. 591,090
Int. Cl.[5] B65D *1/02, 1/42, 23/00*
U.S. Cl. 215—1 C **8 Claims**



1. A thermally stable, vacuum compensable PET container

suitable for hot fill applications comprising a generally amorphous threaded mouth portion and a highly crystallite cylindrical body portion extending from said mouth portion, said body portion having

i) a generally frusto-conical neck portion extending from said mouth portion;

ii) a generally cylindrical side wall portion extending from said neck portion;

iii) a generally circular end wall portion extending from the opposite end of said generally cylindrical side wall portion;

iv) vacuum distortion means in said neck portion and said end wall portion to permit container shrinkage when a vacuum is drawn into said container; and

v) rigidizing means in said cylindrical side wall portion preventing radial and longitudinal movement of said side wall when said vacuum is drawn, said rigidizing means including a plurality of radially inwardly extending ring segments and a plurality of cylindrically shaped flat land segments, said radially inwardly extending ring segments longitudinally spaced from one another and contiguously interconnected by said cylindrically shaped flat land segments, said rigidizing means further including a leading land segment generally adjacent said frusto-conical neck portion and a trailing land segment generally adjacent said end wall portion whereby said trailing and leading land segments permit glued application of conventional thickness paper labels to said container while said land segments and said interconnecting ring segments rigidize said cylindrical side wall portion.

5,067,623

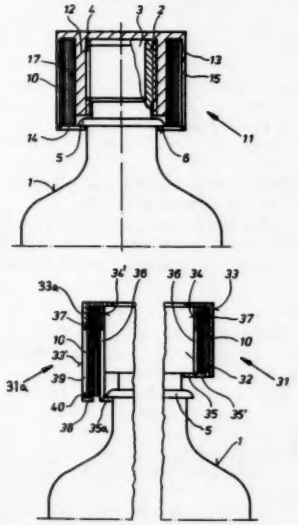
CLOSURE FOR A CONTAINER

Rudolf Lensing, Hinterdorfstrasse 28, D 7947 Mengen-Rulfingen, Fed. Rep. of Germany

Filed Jul. 20, 1990, Ser. No. 556,162

Int. Cl.[5] B65D *51/28*

U.S. Cl. 215—227 **16 Claims**



1. In a combination of a container and a closure therefor, with said closure including a cap that can be placed onto a mouth of said container, the improvement wherein:

said closure, in order to accommodate an enclosure, is provided with a receiving chamber that is disposed concentric to and radially outwardly of said cap; and

at least two radially resilient arms that are formed on said cap and are spaced from an outer surface thereof, with said receiving chamber being disposed between said arms and said cap, with each of said arms having a free end that is provided with an inwardly projecting attachment that cooperates with engagement means disposed on said container for detachably connecting said closure to said container.

5,067,624

PLASTIC CLOSURE FOR CONTAINERS

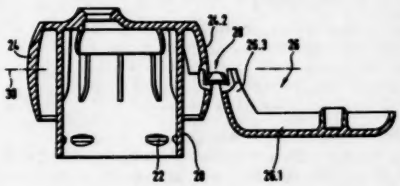
Klaus Thanisch, Bullay, Fed. Rep. of Germany, assignor to Zeller Plastik GmbH, Mosel, Fed. Rep. of Germany

Filed Oct. 1, 1990, Ser. No. 591,236

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 8911643

Int. Cl.[5] B65D *47/08*

U.S. Cl. 215—235 **4 Claims**



1. A closure of plastic for the necks of containers, the closure having an upper end and a bottom end and comprising:

a) the closure having a bottom part having an outer wall and a lid, wherein the outer wall of the closure flares in a longitudinal direction from the upper end of the closure outwardly and downwardly to a circumferential line of maximum size, and then flares inwardly toward the bottom end of the closure,

b) the bottom part and lid of the closure being joined together by a snap hinge (**28**) disposed in the outer wall and being made in one piece with the closure, said snap hinge (**28**) comprising a film hinge (**28.2**) and an intermediate element (**28.4**) on either side thereof,

c) the lid having a main part (**26.1**), the depth of the main part of the lid being substantially less than the difference in the height of the closure between its circumferential line of maximum size and its upper end,

d) the lid having an arm **26.3** forming a connection of the main part (**26.1**) of the lid to the snap hinge,

e) the snap hinge being disposed symmetrically with the circumferential line of maximum size.

5,067,625

DEVICE FOR OPENING AND CLOSING LID

Masanori Numata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jun. 1, 1990, Ser. No. 531,746

Claims priority, application Japan, Jun. 5, 1989, 1-141252

Int. Cl.[5] B65D *43/14, 51/04*

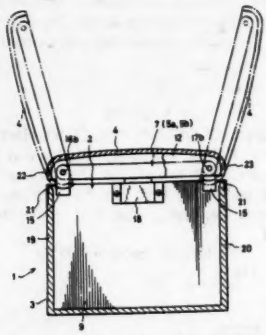
U.S. Cl. 220—343 **17 Claims**

1. A device for opening and closing a lid for opening and closing an opening of a housing, comprising:

first link means having one end linked to a first end of one side edge of said housing and the other end linked to a second end of one side edge of said lid, said one side edge of said housing and said one side edge of said lid facing each other; and

second link means extending parallel to said first link means and having one end like said one end of said first link means linked to a first end of said one side edge of said lid

and the other end like said other end of said first link means linked to a second end of said one side edge of said housing, said first end of said housing and said first end of said lid facing each other, said second end of said housing and said second end of said lid facing each other;



first locking means provided on said one side edge of said housing for locking said first ink means; and

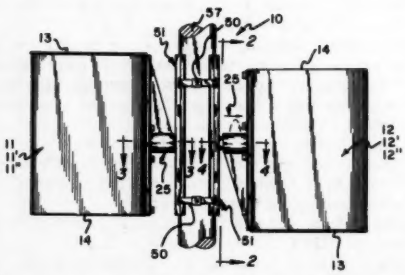
second locking means provided on said one side edge of said housing for locking said second link means.

5,067,626

TRASH RECEPTACLE ADAPTED FOR ROTATABLE MOUNTING HAVING INTEGRAL LOCKING AND SUPPORTING MEANS

Dov A. Leumi, 300 E. Lancaster Ave., Wynwood Apts. #708, Wynwood, Pa. 19160

Filed Jul. 13, 1990, Ser. No. 553,121
Int. Cl.[5] B65F *1/12*
U.S. Cl. 220—475 **4 Claims**



1. An apparatus for collecting and removal of trash comprising at least one basket, integral supporting and locking means for connecting said basket to a supporting structure, said means adapted to (A) support said basket, (B) lock said basket in a normal upright position for receiving and holding trash, (C) be unlocked so as to permit rotation of said basket for emptying said trash wherein said means to lock against rotation includes a stationary interlocking keyed cylinder, a rotating interlocking keyed cylinder, either of said stationary interlocking keyed cylinder or said rotating interlocking keyed cylinder having a key and the other having a keyway which interlock when said basket is in said normal upright position for receiving trash, and to allow said basket to be pulled to unlock said permit rotation so as to empty said trash

wherein said means to lock against rotation includes a spring which is adapted to normally apply force against one of said interlocking keyed cylinders so as to maintain said key and said keyway in an interlocking position and thereby prevent rotation;

wherein said means to lock against rotation further includes a threaded adjustment screw and a complimentary threaded slot, said screw positioned so as to permit adjusting said force exerted by said spring on said interlocking keyed cylinders so as to thereby adjust the pushing or pulling force required to be exerted on said basket to unlock it for rotation;

wherein said means to lock against rotation includes a retainer head on the end of said threaded adjustment screw and a female slot in the opposite end of said threaded adjustment screw, and wherein said basket and said means to lock against rotation have an opening adapted to permit rotation of said screw by a tool from a position within said basket in a direction toward said supporting structure so as to adjust said force exerted by said spring on said interlocking keyed cylinders; and

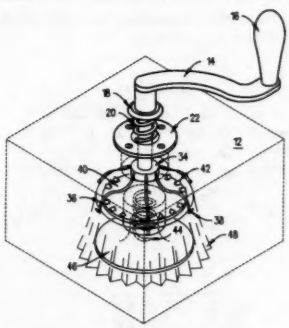
wherein means to lock against rotation further includes means to prevent access to said threaded adjustment screw.

5,067,627

COFFEE FILTER DISPENSER

Michael L. Anderson, 5223 Arizona St., Camp Lejeune, N.C. 28542

Continuation-in-part of Ser. No. 93,777, Sep. 8, 1987, abandoned. This application Jan. 23, 1991, Ser. No. 644,548
Int. Cl.[5] B65H *3/00*
U.S. Cl. 221—36 **13 Claims**



1. A new and improved coffee filter dispenser, comprising:

housing means;

door means in said housing means;

means for holding a stack of nested coffee filters in said housing;

plunger means mounted for axial and rotary motion, extending through said housing means; and

means for engaging a top filter of said stack of nested coffee filters, attached to said plunger means, whereby a single coffee filter may be dispensed through said door means.

5,067,628

DISPENSER FOR NOTE PAD SHEETS

Mel Evenson, c/o Eldon Industries, Inc., 9920 La Cienega Blvd., P.O. Box H-130, Inglewood, Calif. 90301

Filed Jun. 29, 1990, Ser. No. 546,416
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—52 **10 Claims**

1. A disperser comprising:

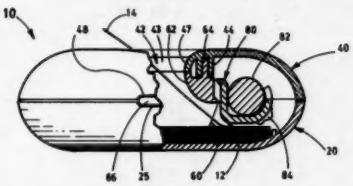
a base member for supporting fan-folded notes;

a lid member;

means for releasably connecting the base member and lid member to one another so that the base member and lid member are spaced from one another and form an enclosure to receive and enclose the fan-folded notes;

means for dispensing the fan-folded notes one at a time from the enclosure;

a weighted member located within the enclosure and positioned to contact the top of the fan-folded notes, the weighted member being movable relative to the base member and lid member as the fan-folded notes are individually removed, said weighted member being comprised of a pair of spaced weight elements that are connected to one another by a pair of connecting members so as to define an aperture therebetween, and



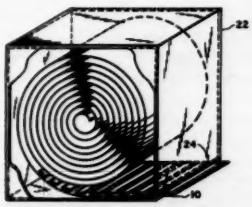
a guide member connected to said lid member and extending downward into said enclosure, said guide member including a central body and a second slot centrally located therein so as to be substantially aligned with said first slot, said central body being dimensioned such that the aperture of said weighted member may encompass said central body and move up and down relative to said guide member.

5,067,629

METHOD FOR DISPENSING DRINKING STRAWS AND A SUPPLY ARRANGEMENT THEREFOR

William K. Schwartz, 1160 Fifth Ave., Apt. 603, New York, N.Y. 10029-6928

Filed Sep. 21, 1990, Ser. No. 586,613
Int. Cl.[5] B65H *5/28*
U.S. Cl. 221—70 **15 Claims**



1. A supply arrangement for use in dispensing drinking straws, said arrangement comprising:

(a) A plurality of substantially flattened, flexible hollow tubes, each tube having a convenient length and cross-section for a drinking straw, said tubes being arranged substantially in parallel; and

(b) means for pressing said tubes to maintain their flattened configuration along substantially their entire length.

5,067,630

VENDING MACHINE

Thomas A. Nesser; Deborah L. Nesser; Edward P. Joslyn, all of Rochester; Bernard J. Rick, Fairport; Herbert Luckower, Harrison, and John P. Barczak, Rochester, all of N.Y., assignors to G. T. Norton, Inc., Rochester, N.Y.

Continuation of Ser. No. 87,487, Aug. 20, 1987, abandoned. This application Nov. 29, 1988, Ser. No. 277,483
Int. Cl.[5] G07F *11/54, 11/58*
U.S. Cl. 221—76 **29 Claims**

1. In a vending machine having a cabinet, apparatus whereby refilling of the cabinet with a fresh supply of articles to be dispensed can be accomplished by removal from the cabinet and replacement in the cabinet as an integrated assembly which is portable as a unitary body, which apparatus comprises:

a drive mechanism fixedly mounted in said cabinet and having at least one drive member at at least one position in said cabinet along a surface thereof facing the integrated assembly when said integrated assembly is in said cabinet;

said integrated assembly including:

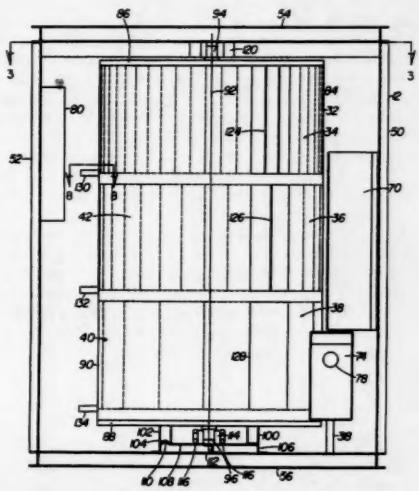
(a) a housing enclosing a unitary body providing at least one carrier for items or articles to be vended,

(b) means for providing a rotatable support for said carrier in said housing,

(c) a driven member connected to said at least one carrier for rotating said at least one carrier and having means coupling to said at least one drive member when said assembly is in said cabinet, and

(d) locating members on said housing which are disposed in a first predetermined spacial relationship with said driven member;

means including supporting and guiding members on at least one inside surface of said cabinet for removably receiving said integrated assembly in supported relationship in said cabinet with said driven member directly coupled to said



at least one drive member and in contact with each other, said supporting and guiding members on said at least one inside surface of said cabinet supporting and guiding said integrated assembly when being removed from and placed in said cabinet and when located in said cabinet, said supporting and guiding members being fixedly mounted in said cabinet in a second predetermined spacial relationship with said at least one drive member corresponding to said first spacial relationship of said locating members and said driven member which said first and said second predetermined spatial relationships bring said drive member and driven member into contact directly coupled in driving relationship, said supporting and guiding members having surfaces engageable with said locating members which locate and capture said integrated assembly in said cabinet, wherein said cabinet has a coin mechanism which accepts coins for articles or items vended and further comprising a coin receiving container attached to said housing and being part of said integrated assembly, and said container being disposed in coin receiving relationship with said coin mechanism when said integrated assembly is in said cabinet.

5,067,631

PART ISOLATING APPARATUS

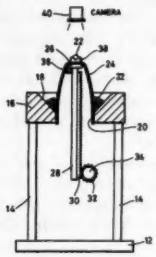
Tsuyoshi Baba, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,858

Claims priority, application Japan, Dec. 5, 1988, 63-157621[U]; Oct. 6, 1989, 1-117156[U]

Int. Cl.[5] A24F *15/04*

U.S. Cl. 221—254 24 Claims



1. A part isolating apparatus comprising:

an isolation table having an upper surface and a lower surface, with said upper surface having an upper edge portion defining an opening and said lower surface having a lower edge portion defining an opening, and said table including a bore extending from said upper edge portion to said lower edge portion and being defined by a sloping surface sloping inwardly toward said lower edge portion;

bag means, mounted around said lower edge portion and disposed beneath said isolation table, for receiving therein a plurality of parts to be isolated when said bag means is lifted through the bore; and

thrusting means disposed beneath said bag means for lifting said bag means through the bore and isolating at least one of the parts from other parts, wherein when said bag means is lifted the other parts not isolated by said thrusting means are contained within a space defined by said sloping surface and a portion of said lifted bag means.

5,067,632

DEVICE FOR THE INDIVIDUAL FEEDING OF STUDS OR BOLTS

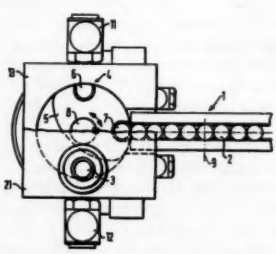
Friedhelm Aubry, Velbert, Fed. Rep. of Germany, assignor to TRW Nelson BolzenschweiB-Technik GmbH & Co. KG, Gevelsburg, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 549,217

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922439

Int. Cl.[5] G07F *11/24*

U.S. Cl. 221—266 16 Claims



1. Device for the individual feeding of bolts, or the like, arranged one after another between guide rails, to at least two bolt outlets, blasted with air, leading to at least two bolt-welding devices, with a rotor arranged between said guide rails and the bolt outlets leading to said bolt-welding devices, with at least two receiving slots for receiving one bolt, said receiving slots being designed as blind holes.

5,067,633

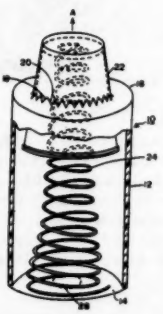
DISPOSABLE PLASTIC CUP DISPENSER WITH SPRING

Edward G. Grosz, Sodus Point; Fox J. Herrington, Holcomb, and Eric A. St. Phillips, Fairport, all of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 9, 1988, Ser. No. 281,597

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—279 10 Claims



1. A disposable cub dispenser for the packaging and discrete individual dispensing of cups from a stack of inverted nested cuts each of which has a tapered sidewall, a bottom wall at the smaller end thereof and an open top encompassed by an outer beaded rim structure; said dispenser comprising a generally vertically oriented tubular member having a peripheral sidewall structure, a bottom wall and a top wall, said top wall being a radially inwardly crimped portion of said peripheral wall structure forming an aperture with a serrated resilient annular edge, a portion of the endmost cup of the stack of cups protruding upwardly through said aperture in engagement with said serrated edge, said serrated edge being radially resiliently widenable in response to an upward pull being exerted upon said endmost cup to facilitate passage therethrough and separation from the remainder of said stack of cups; and means in said tubular member for exerting an axial biasing force on said stack of cups to position the remaining cups of said stack in readiness for dispensing a successive cup from said aperture, wherein said biasing means comprises a helical compression spring axially extending between the lowermost cup of said stack of cups and the bottom wall of said tubular member, said helical compression spring having one end contacting the inner surface of the bottom wall of said tubular member and an opposite end contacting the bottom wall of the lowermost cup of said stack of cups.

5,067,634

SINGLE PRODUCT EXTRACTOR

Félix Guindulain Vidondo, Peralta, Spain, assignor to Jofemar, S.A., Peralta, Spain

Filed Feb. 22, 1990, Ser. No. 483,933

Claims priority, application Spain, Mar. 10, 1989, 8900887

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—298 4 Claims

1. An apparatus for dispensing articles in an automatic vending machine comprising:

an L-shaped strip for supporting said articles to be dispensed one above the other, one leg of said L-shaped strip extending in an upward direction and the horizontal leg having a hole therethrough;

a movable plate positioned on the top surface of the horizontal leg of said L-shaped strip above said hole and contact-

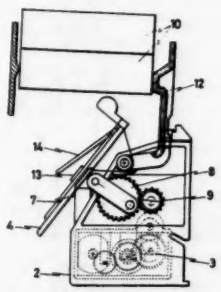
ing the bottom surface of the bottom one of said articles to be dispensed;

a motor having a rotatable shaft;

a pinion connected to said shaft, said pinion having a plurality of protrusions around the circumference of said pinion;

a toothed wheel interlocking with said plurality of protrusions;

a cam having one end coupled to said toothed wheel and the other end mounted to said L-shaped strip, said cam being rotated in response to said motor rotating said shaft so that the horizontal leg of said L-shaped strip is rotated in a downward direction;



a pair of retaining plates positioned on either side of said articles, one of said retaining plates being actuated by said cam being rotated so that said one of said retaining plates being actuated bears against one of said articles above the bottom one of said articles whereby said one of said articles above the bottom one of said articles is held between said pair of retaining plates; and

a strip attached to said motor positioned below said movable plate and extending in an upward direction so that, when said horizontal leg of said L-shaped strip is rotated in said downward direction, said strip contacts said movable plate to lift said movable plate off of said L-shaped strip, thereby lifting the bottom one of said articles off of said L-shaped strip to dispense the bottom one of said articles.

5,067,635

DISPENSER POUCH AND HOLDER AND DISPENSING UNIT THEREFOR

Peter Thomsen, 20 William Street, Henley 2111 Sydney, Australia

Continuation of Ser. No. 807,293, Dec. 10, 1985, abandoned. This application Dec. 6, 1990, Ser. No. 623,097

Int. Cl.[5] B65D *35/28*

U.S. Cl. 222—103 **17 Claims**

1. A dispenser pouch comprising

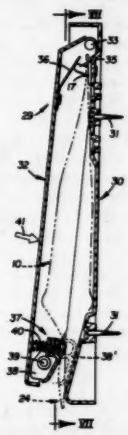
a pair of panels defining a reservoir, having laterally spaced and co-extensive inner sides, adapted to contain a liquid therein,

spout means defining a charging chamber, having laterally spaced and co-extensive inner sides, between opposed panel portions of said panels on a lower end of said pouch and communicating with said reservoir for retaining a pre-measured charge of said liquid therein, and

normally closed valve means communicating directly with said charging chamber and terminating at an inner end thereof solely at a lower end of said spout means, including a passage solely defined by and between superimposed flat portions of said panels extending throughout the entire length of said valve means and that are normally flattened and entirely compressed together automatically in direct response to the weight of the liquid in said reservoir and spout means and resulting outward pressure on said panel portions, when said pouch is suspended vertically, to close said valve means when said charging chamber is filled with said liquid, for opening to entirely separate the superimposed flat portions of said panels to pump and solely dispense said pre-measured charge of liquid from said charging chamber in response to the application of a predetermined level of external and descending pumping pressure on said spout means, and for again closing to entirely compress said superimposed flat portions together to close said valve means when said pressure is removed from said spout means, said passage having a width throughout its entire length that is substantially less than the width of said charging chamber,

the inner sides defining said reservoir comprising laterally spaced and co-extensive upper inner sides and contiguous and co-extenstive lower inner sides extending downwardly to slope towards each other and towards said spout means to intersect with a respective inner side defining said charging chamber to define a bottom termination of said reservoir and an upper termination of said charging chamber, the inner sides defining said charging chamber having lengths substantially greater than the lengths of the lower inner sides defining said reservoir and the lengths of the inner sides defining said charging chamber being substantially greater than the length of said passage.

13. A dispenser pouch in combination with a combined holder and dispensing unit, said dispenser pouch comprising



a pair of panels defining a reservoir adapted to contain a liquid therein,

spout means defining a charging chamber between said panels on a lower end of said pouch communicating with said reservoir for retaining a pre-measured charge of said liquid therein, and

normally closed valve means at a lower end of said spout means, including a normally closed passage solely defined by and between said panels and communicating with said charging chamber, for opening to dispense said charge of liquid from said charging chamber in response to the application of a pre-determined level of external and descending pumping pressure on said spout means, said holder and dispensing unit comprising

a mounting bracket having said dispenser pouch mounted thereon, and

compression means mounted on said unit to overly said spout means for selectively applying said pre-determined level of external and descending pumping pressure by first applying pressure in a generally horizontal direction and then applying pressure in a generally vertically downward direction on said spout means to open said passage to dispense said charge of liquid therefrom.

5,067,636

CONTAINER ASSEMBLY FOR THE TRANSPORT, STORAGE AND DISPENSING OF FLOWABLE MATERIALS

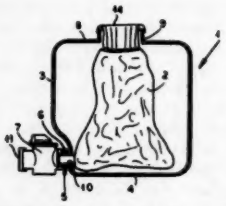
Pierre Pfeiffer, Drulingen; Benoit Cheval, Saverne, and Paul Sigwalt, Drulingen, all of France, assignors to Sotralentz S. A., Drulingen, France

Filed Sep. 7, 1989, Ser. No. 404,305

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1988, 3830487

Int. Cl.[5] B65D *35/56*

U.S. Cl. 222—105 **2 Claims**



1. A container assembly for the transportation, storage and dispensing of a flowable material, comprising:

an outer load-bearing container composed of thermoplastic material and formed with an upper wall having a large-caliber closable aperture affording access into an interior of the outer container, lateral wall means around said interior, a base for said outer container and an outlet pipe spigot formed on said lateral wall means near said base, said outlet pipe spigot being formed with an external screwthread;

an inner container in the form of a collapsible flexible-wall sack composed of a plastic sheet material received in said interior of said outer container and formed with a hose spigot extending through said outlet pipe spigot and secured to an outer edge of said outlet pipe spigot, said sack being fillable with said material and, when filled, conforming to the configuration of said outer container, said sack having a top-filling aperture temporarily connectable to said large-caliber closable aperture in said upper wall of said outer container and including means for closing and detaching from said top-filling aperture, said container when at least partially filled being free from connection to said large-caliber closable aperture and said upper wall; and

a valve threaded onto said outlet pipe spigot for opening and closing flow through said hose spigot.

5,067,637

CANTEEN BOTTLE FOR DISPENSING RATIONED DRINKS

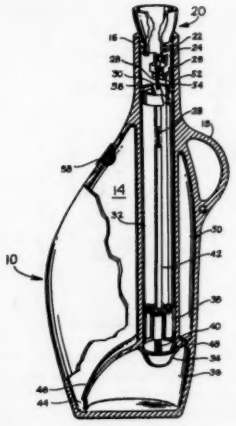
Harold O. Aurness, 5808 Knox Ave. N., Brooklyn Center, Minn. 55430, and Tony L. Jones, 1615 Russell Ave. N., Minneapolis, Minn. 55411

Filed Mar. 5, 1990, Ser. No. 487,857

Int. Cl.[5] B67D *5/64*

U.S. Cl. 222—175 **5 Claims**

1. In a canteen bottle attachable to a carrying device on a running or walking person which can dispense a premeasured ration of liquid comprising a bottle of general bottle shape with a round neck offset at the top of the bottle, a handle near the neck, a capped filling hole, a rotatable mouthpiece extending from the bottle neck and gasketed therein, a holding shelf on the bottom of the mouthpiece to firmly hold the top end of a stopper stem reaching to a pliable stopper covering a hole in the top of a holding chamber in the bottom of the bottle, and which holding shelf also provides a plug member to fit a passage hole in a stationary gate in the bottle neck which allows passage of liquid into the mouthpiece from a neck tube which is an extension of the bottle neck below the stationary gate going to the holding chamber, and with a recess in the top of the stationary gate to fit the plug member of the holding shelf to hold the stopper in a partially open position; a flexible tube spacer on the stopper stem to hold the stopper stem centered in the neck tube to keep the stopper aligned with the holding chamber hole, a rigid spacer tube extending on the stopper stem between the stationary gate and the flexible tube spacer to hold the flexible tube spacer from vertical slippage, with a spiral spring spacer between the stopper and the flexible tube spacer to keep the stopper in a normal open position until the



bottle is used for a drink; a relief chamber alongside the neck tube with access through a bottom hole to the holding chamber; an access opening in the wall of the holding chamber to a reservoir for liquid in the interior of the bottle whereby the liquid may flow into the holding chamber and neck tube around the stopper in open position and be trapped by the stopper in closed, or drinking position; further comprising a carrying device attachable to the user with a variable tether means connecting the bottle and the carrying device.

5,067,638

DEVICE FOR DISPENSING MEASURES OF A GIVEN VOLUME OF A LIQUID CONTAINED IN A DEFORMABLE CONTAINER COMPRISING A SAFETY ELEMENT

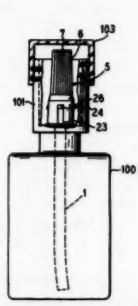
Tristan Bavaveas, Paris, France, assignor to Societe dite: Eparco S.A., France

Filed Jul. 28, 1989, Ser. No. 387,020

Claims priority, application France, Jul. 29, 1988, 8810285

Int. Cl.[5] G01F *11/26*

U.S. Cl. 222—205 **15 Claims**



1. A device for dispensing measures of a given volume of a liquid contained in a deformable container of the type compris-

ing a cup fixed in a neck of the container and having a base of which there is a feed hole for the liquid and a tube accommodated in an integral manner in the cup being fixed to the base and communicating with the feed hole via its lower end and being provided at its upper end with an outlet hole, the dispensing device being protected by a removable cap, said device including a one-piece, axially hollow, displaceable safety element comprising an upper gripping part having a transverse closing face, a hollow central part forming a valve member, and a hollow lower part forming a slide and outlet orifice, said safety element being mounted so as to slide axially on the tube via its lower part between a limited lower position and a limited upper position, said lower position having the central part closing said outlet holes to prevent passage of liquid from the container through the tube to the cup, said upper position having the central part opening said outlet hole to allow flow between the container via the tube, and the upper gripping part of the safety element projecting partially from the cup so that once the cap is removed by the user, the user, in order to use the device for dispensing measures, must deliberately move the safety element from the lower position to the upper position to permit flow from the container through the outlet hole into the cup.

5,067,639

POURING SPOUT WHICH CAN BE SELECTIVELY OPENED AND CLOSED

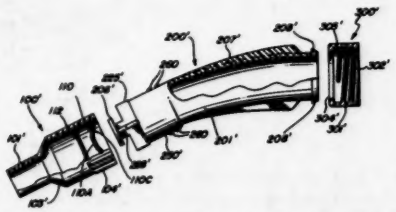
Paul R. Maguire, 4284 Sea View La., Los Angeles, Calif. 90065, and John M. Lown, 222 La Jolla La., Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 413,185, Sep. 27, 1989, Pat. No. 5,000,360. This application Dec. 4, 1990, Ser. No. 621,995

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] B67D *5/72*

U.S. Cl. 222—521 **14 Claims**



1. A sealable pouring spout adapted to be releasably secured to an oil container or the like comprising:

a) a tubular body member having an attachment end and a pouring end, the attachment end defining an annular lip extending outwardly from the body member and the pouring end having a cylindrically shaped outer surface portion;

b) a connector member rotatably mounted on the attachment end of the tubular body member and extending over the lip thereof, the connector member defining threads adapted to engage complementary threads on the container; and

c) a funnel shaped member rotatably mounted on the tubular body member adjacent the pouring end thereof, the funnel shaped member including a rear cylindrical section having a cylindrically shaped inner surface which surrounds the tubular body member adjacent the pouring end thereof, a front cylindrical section of smaller diameter than the pouring end of the tubular body member and a tapered section joining the front and rear sections, the funnel shaped member further having an outlet end through which material to be dispensed from the container flows;

d) the cylindrically shaped inner surface of the funnel shaped member defining an inwardly projecting cam surface extending circumferentially about the tubular body member from at least one high point to at least one low point, the low point being positioned at a greater distance from the pouring end of the tubular body member than the high point, the tubular body member outer surface defining a cam lobe follower riding on said cam surface so that rotation of the funnel shaped member in either direction relative to the tubular body member causes the outlet end of the funnel shaped member to move toward and away from the pouring end of the tubular body member; and

e) the tubular body and funnel shaped members having cooperating closure means comprising a stopper member mounted on the pouring end of the tubular body member for sealingly engaging the tapered section of the funnel shaped member when the outlet end of the funnel shaped member is moved toward the pouring end of the tubular body member the maximum distance allowed by the cam surface and the cam lobe follower.

5,067,640

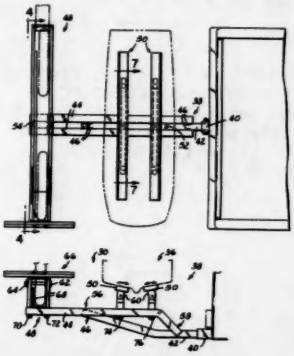
UNIVERSAL WHEELLESS CARRIER

Albert Gaskill, 22644 Point Dr., St. Clair Shores, Mich. 48081

Filed Dec. 18, 1989, Ser. No. 452,542

Int. Cl.[5] B60R *9/00*

U.S. Cl. 224—42.07 **20 Claims**



1. A universal wheelless carrier mounted to a transporting vehicle's trailer hitch for transporting a load, comprising:

a main elongated support member cantilevered from said trailer hitch, said main elongated support member having a first and second end, said first end adapted to be received and retained by said trailer hitch, said second end having two elongated parallel support beams, said beams slightly spaced apart and longitudinally extending generally rearward from said transporting vehicle;

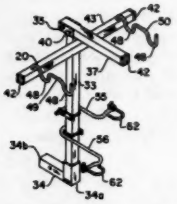
a first load-bearing member positioned above and transverse to said elongated parallel support beams, said first load-bearing member having two distal ends and a locating pad, said distal ends extending substantially beyond and cantilevered from said beams and said locating pad protruding from said first load-bearing member and located between said two ends, said locating pad adapted to be received between said slightly spaced apart beams; and

means for fastening said first load-bearing member to said spaced apart beams.

5,067,641
VEHICLE BICYCLE CARRIER

Richard B. Johnson, Tecumseh, and Thomas P. Schneider, Ypsilanti, both of Mich., assignors to Valley Industries, Inc., Madison Heights, Mich.

Filed Jan. 30, 1990, Ser. No. 472,037
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—042.03 B **14 Claims**



1. A universal carrier having a three point mounting arrangement for transporting bicycles, one behind the other, on a motor vehicle comprising, in combination: a slender upright member; a means for detachably securing a lower end portion of said upright member to a motor vehicle; a slender transverse horizontal member fixedly attached at the center thereof to said upright member; a pair of slender longitudinal horizontal brackets, each of said brackets having a base end portion fixedly attached to an end portion of said transverse member and adapted to support an upper portion of at least one bicycle; a third slender longitudinal horizontal bracket slideably attached below said first pair of brackets to said upright member, said third bracket being vertically adjustable on said upright member and adapted to support a third portion of said bicycle; and a means for adjusting the vertical position of said third bracket on said upright member.

5,067,642
SHOULDER HOLSTER WITH CONCEALED SUPPORTING CHEST STRAP

Gary L. Fodge, General Delivery, Globe, Ariz. 85501

Filed Dec. 7, 1990, Ser. No. 623,516
Int. Cl.[5] F41G *33/02*
U.S. Cl. 224—192 **18 Claims**

1. A shoulder holster to be worn outside a person's shirt with no visible supporting chest strap nor with a chest strap piercing the shirt, the shoulder holster comprising:

a holster for receiving a handgun;

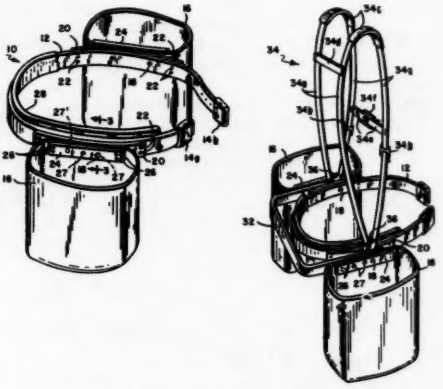
a chest strap worn under the person's shirt; and

means operably securing said holster to said chest strap, said means defining a shirt lock hub attached to said chest strap under the person's shirt, said shirt lock hub having an interior opening therethrough, said interior opening having a diameter thereof, and an annularly shaped shirt lock attached to said holster, said shirt lock having a diameter thereof less than said shirt lock hub interior opening diameter, said shirt lock hub interior opening adapted to receive therein firstly the person's shirt and secondly said annularly shaped shirt lock, said shirt lock operably engaging said shirt lock hub interior opening to secure said holster to said chest strap whereby said said chest strap is worn inside the person's shirt and said holster is worn outside the person's shirt.

5,067,643
HIP-LEVEL PACK FRAME

John McKinney, P.O. Box 96, Coram, Mont. 59913

Filed Feb. 2, 1989, Ser. No. 305,781
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—197 **8 Claims**



1. A hip-level pack comprising

a belt arranged to be releasably secured about a wearer's waist;

a plurality of relatively large bags positioned along the belt on both sides of the wearer so that loads carried in said bags may be balanced;

a generally U-shaped frame member for extending around the wearer's back outboard of said belt;

means for pivotally connecting an upper margin of each bag individually about pins aligned with and disposed from the wearer's hips and axially fixed to the belt so that when the belt is secured about the wearer's waist, each bag is supported for free swinging movement about each pin individually relative to the belt and the wearer's hips, and

means for securing the opposite edges of said frame member to said pair of connecting means.

5,067,644
RACK PROTECTIVE DEVICE

Robert A. Coleman, 19612 Grandview Dr., Topanga, Calif. 90290

Filed Sep. 21, 1990, Ser. No. 586,431
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—324 **7 Claims**

1. A device for protecting items that are placed atop first and second horizontal members of any vehicle rack, comprising:

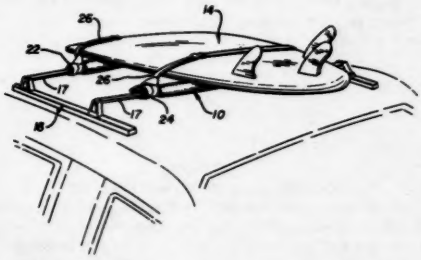
a first elongated member comprised of a dense protective

material of a sufficient thickness to ensure that the item to be placed on the rack will be protected, said first elongated member having a first and a second end and an upper surface and a lower surface, said lower surface having a recessed substantially C-shaped concave aperture therein capable of receiving and fitting totally around and over the length of the first horizontal bar member;

a second elongated member comprised of a dense protective material of a sufficient thickness to ensure that the item to be placed on the rack will be protected, said second elongated member having a first and a second end and an upper surface and a lower surface, said lower surface having a recessed substantially C-shaped concave aperture therein capable of receiving and fitting totally around and over the length of the second horizontal bar member of the rack;

a first strap having a first and a second end, said first end of said first strap being permanently affixed to said first end of said first elongated member for rigidly affixing the first elongated member to the first horizontal bar, and having first means for connecting the attached to said second end of said first strap;

a second strap having a first and a second end, said first end of said second strap being permanently affixed to said



second end of said first elongated member for rigidly attaching the first elongated member to the first horizontal bar, and having second means for connecting attached to said second end of said second strap, said second connecting means capable of receiving said first connecting means, whereby the first end of an item to be protected will be rigidly affixed to the upper surface of the first elongated member;

a third strap having a first and a second end, said first end of said third strap being permanently affixed to said first end of said second elongated member for rigidly affixing the second elongated member to the second horizontal bar, and having third means for connecting attached to said second end of said third strap;

a fourth strap having a first and a second end, said first end of said fourth strap being permanently affixed to said second end of said second elongated member for rigidly attaching the second elongated member to the second horizontal bar, and having fourth means for connecting attached to said second end of said fourth strap, said fourth connecting means cable of receiving said third connecting means, whereby the second end of an item to be protected will be rigidly affixed to the upper surface of the second elongated member.

5,067,645

APPARATUS FOR SIZING ELONGATED FOOD PIECES

Roger D. Johnson, Canyon Country, Calif., assignor to Nestec S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 226,903, Aug. 1, 1988. This application Jul. 9, 1990, Ser. No. 550,263

Int. Cl.[5] B26F *3/02*; B26D *1/62*

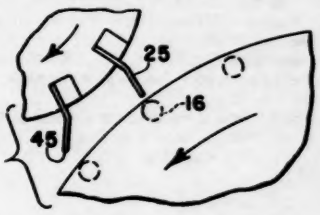
U.S. Cl. 225—93 **9 Claims**

1. Apparatus for sizing a mix of randomly sized food pieces into pieces of a predetermined maximum length which comprises

a first cylindrical member and a second cylindrical member mounted for rotation on parallel axial shafts and interconnected for rotation in opposing directions,

said first cylindrical member having a pair of spaced circular support plates mounted on a first axial shaft and a plurality of axially parallel longitudinal bars mounted between the support plates equidistant around the periphery thereof substantially parallel to said first shaft and spaced apart a distance equal to the desired maximum length of the food pieces to be sized,

said second cylindrical member having a plurality of spaced circular support plates mounted on a second axial shaft and a plurality of axially parallel elongated cutting blades mounted on the support plates equidistant around the



periphery thereof substantially parallel to said second shaft and spaced apart a distance equal to the spacing between the longitudinal bars on said first cylindrical member, and

first conveyor means having an end adjacent said first cylindrical member for depositing a mix of randomly sized food pieces, including elongated pieces having a length exceeding a predetermined maximum length, onto said first cylindrical member with the longitudinal axes of said elongated pieces being substantially perpendicular to the axes of the longitudinal bars on said first cylindrical member,

said cylindrical members being operably mounted and driven so that said cutting blades pass in close proximity to said longitudinal bars without contacting said bars to thereby cut elongated pieces carried on the first cylindrical member between the rotating members.

5,067,646

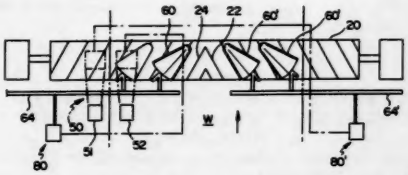
APPARATUS FOR CONTROLLING A WEB

William O. Young, Jr., and George H. Lark, both of Spartanburg, S.C., assignors to Young Engineering, Inc., Spartanburg, S.C.

Filed Oct. 17, 1988, Ser. No. 258,746

Int. Cl.[5] B65H *23/02*

U.S. Cl. 226—015 **4 Claims**



1. Apparatus for imparting force against a web moving across a roll for bringing about lateral movement of the web with respect to the path of travel of the web comprising:

a) a shaft mounted for oscillation adjacent said path of travel;

b) a plurality of web contacting means located along said shaft, said web contacting means comprising a first arm secured to said shaft for oscillation therewith, a second

arm located atop said first arm and being pivotally secured thereto, said second arm extending beyond an outer free end of said first arm and having an element received thereon for contact with said web;

c) shaft movement means comprising a further arm connected to said shaft and means connected to said further arm for imparting to and fro motion thereto, whereby said shaft may be oscillated to move said elements into and out of contact with a side of said web opposite said roll; and

d) sensor means located along said path of travel of said web for actuating said shaft movement means when said web is sensed out of lateral alignment along said path of travel.

5,067,647

APPARATUS FOR FASTENING SEMICONDUCTOR COMPONENTS TO SUBSTRATES

Herbert Schwarzbaner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

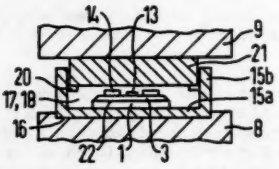
Division of Ser. No. 317,596, Mar. 1, 1989, Pat. No. 4,903,886. This application Dec. 5, 1989, Ser. No. 446,414

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806980

The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.

Int. Cl.[5] B23K *20/02*

U.S. Cl. 228—5.5 **2 Claims**



1. An arrangement for fastening semiconductor components to substrates, comprising:

a receptacle means for receiving a component and a substrate, said receptacle means comprising a floor part and a lateral wall part;

a die movable in a direction of said floor part to augment said receptacle chamber;

a press into which said receptacle chamber is introduced, said floor part being supported against a first press ram of said press and said die being supported against a second press ram of said press to exert pressing power;

a deformable member in said receptacle chamber, said deformable member being of a volume that substantially completely fills an interior of said receptacle chamber when pressing power is applied;

an advanced edge of said die, said advanced edge embracing said lateral wall part of said receptacle means; and

a sealing ring pressing against an inside of said advanced edge, said sealing ring being supported against an edge of said lateral wall part.

5,067,648

APPARATUS FOR HOLDING PRINTED CIRCUIT BOARDS DURING WAVE SOLDERING AND PROCESSING

Michael R. Cascini, Hudson, N.H., assignor to Lockheed Sanders, Inc., Nashua, N.H.

Filed Jul. 27, 1990, Ser. No. 559,869

Int. Cl.[5] B23K *37/04;* **B25B** *1/20*

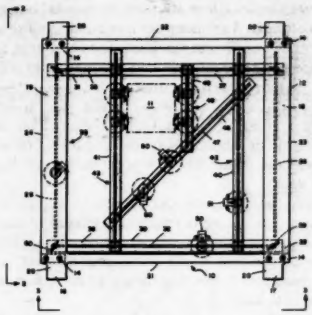
U.S. Cl. 228—47 **8 Claims**

1. An apparatus for supporting printed circuit boards during processing, comprising:

a peripheral frame;

a multiplicity of support members having interfacing flat surfaces defining an imaginary reference plane from both sides thereof;

means for affixing two or more support members to the peripheral frame; and



means for supporting printed circuit boards parallel to and in reference to the imaginary plane and including means for engaging the support members along either of the interfacing surfaces defining the reference plane.

5,067,649

BONDING METAL COMPONENTS

Roy Hardwick, Troon, Ayrshire, Wales, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 395,154, Aug. 17, 1989, abandoned, which is a continuation of Ser. No. 240,496, Sep. 2, 1988, abandoned. This application Nov. 6, 1990, Ser. No. 608,638

Claims priority, application United Kingdom, Sep. 18, 1987, 8721984; Feb. 1, 1988, 8802169

Int. Cl.[5] B23K *20/08*

U.S. Cl. 228—107 **7 Claims**

1. A method of manufacturing a hollow metallic structure comprising explosively bonding metal components at selected areas only of adjacent surfaces, said surfaces having the same composition, to form a composite structure having at least one unbonded area between adjacent surfaces which is enclosed by bonded area;

heat treating the composite at appropriate elevated temperature to enhance and render more uniform the strength of bonding between the components of the composite structure;

and introducing pressurized gas between the adjacent components at the enclosed unbonded area to superplastically form the composite structure into the desired hollow structure.

5,067,650

MAILBOX PROTECTOR

Mark G. Jones, Rte. 6, Box 49B, Paris, Tex. 75460, and Tommy T. Wright, Rte. 2, Box 306, Center, Tex. 75935

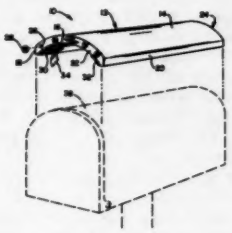
Filed Nov. 7, 1990, Ser. No. 610,407

Int. Cl.[5] B65D *91/00*

U.S. Cl. 232—17 **7 Claims**

1. A mailbox protector comprising a cover member adapted

to be attached to a mailbox, a reservoir within the cover member, a non-toxic dye within the reservoir, and means for expel-



ling the dye from the reservoir whenever a crushing blow is applied to the cover member.

5,067,651

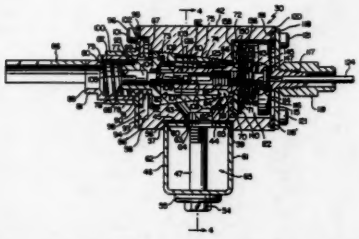
FUEL CONTROL DEVICE, FUEL CONTROL SYSTEM USING THE DEVICE AND METHOD OF MAKING THE DEVICE

Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 482,181, Feb. 20, 1990, abandoned, which is a division of Ser. No. 288,761, Dec. 22, 1988, Pat. No. 4,921,161, which is a division of Ser. No. 192,337, May 10, 1988, Pat. No. 4,813,596. This application Apr. 8, 1991, Ser. No. 682,445

Int. Cl.[5] F23N *1/00*

U.S. Cl. 236—15 A **6 Claims**



1. In a method of making a fuel control device comprising the steps of providing a housing means having an inlet for being inteconnected with a fuel source and an outlet for being interconnected to a main burner means, forming said housing means with a main valve seat between said inlet and said outlet and with a thermostatically operated valve member for opening and closing said main valve seat, and forming said housing means to have an annular heater pilot valve seat surrounding said mean valve seat and being opened and closed by said thermostatically operated valve member at the same time that said thermostatically operated valve member is opening and closing said main valve seat, the improvement comprising the steps of forming said housing means to have an auxiliary fuel supply means for surrounding said heater pilot valve seat with an auxiliary flow of fuel at the same time that said thermostatically operated valve member is opening said main valve seat and said heater pilot valve seat, forming said housing means to have passage means for interconnecting said inlet to said auxiliary fuel supply means independently of said main valve seat, forming said housing means to have an axially movable selector shaft means for setting said thermostatically operated valve member, forming said shaft means to have a shoulder means, forming said valve member to have opening means passing therethrough and telescopically receiving said shaft means therethrough, disposing spring means to be carried by said shaft means and normally urege said valve member against said shoulder means, forming said shaft means to pass through said main valve seat and cooperate with said main valve seat and said opening means of said valve member to provide a by-pass flow of fuel from said inlet to said outlet when said valve member is closed against said valve seat, forming said shaft means to have an annular plate means carried thereby that cooperates with one side of said valve member to normally provide an annular space therebetween that provides part of said by-pass flow, forming said plate means to be adapted to close against said one side of said valve member when said valve member is seated against said valve seat so as to close said annular space, and formign said plate means to have an opening passing therethrough that cooperates with said main valve seat and said opening means of said valve member to provide a by-pass flow of fuel from said inlet to said outlet even when said annular space is closed, forming said spring means to comprise two separate compression springs, disposing one of said springs between said plate means and an abutment means on said control device, and disposing the other of said springs between said plate means and said valve member to normally hold said valve member against said shoulder means and spaced from said plate means to provide said annular space therebetween.

5,067,652

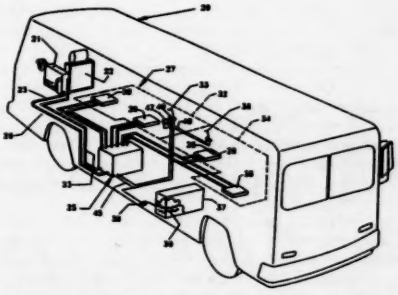
SUPPLEMENTAL VEHICLE HEATING METHOD AND APPARATUS WITH LONG HEATING CYCLE

Harold R. Enander, 23451 E. 156 Ave., Brighton, Colo. 80601

Division of Ser. No. 318,392, Mar. 2, 1989. This application Mar. 1, 1990, Ser. No. 486,686

Int. Cl.[5] B60H *1/02*

U.S. Cl. 237—81 **6 Claims**



1. A method of selecting heat transfer liquid for use in a burner of an auxiliary heating system, comprising the steps of:

determining the thermal output of said burner during a minimum operational cycle of said burner;

selecting heat transfer liquid having a thermal energy storage capacity equal to said thermal output of said burner; and

providing said heat transfer liquid in heat transfer relationship with said burner.

5,067,653

SCREEN FORMING APPARATUS AND METHOD

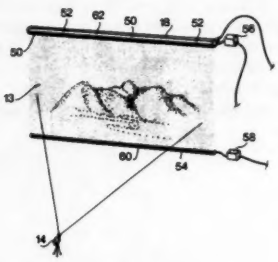
Toshimitsu Araki, Musashino; Fumihiko Kawamata, Chiba; Masayuki Ogino, Tokyo; Hitoshi Miyagawa, Kanagawa; Toshio Kamata, Tokyo; Mitsuo Watanabe, Funabashi, and Kunihiro Miyashita, Tokyo, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Division of Ser. No. 337,009, Apr. 12, 1989, Pat. No. 4,974,779. This application Jun. 12, 1990, Ser. No. 536,812

Claims priority, application Japan, Apr. 14, 1988, 63-90410; Sep. 12, 1988, 63-226390; Jan. 31, 1989, 1-19809; Jan. 31, 1989, 1-19810; Feb. 3, 1989, 1-23816

Int. Cl.[5] B05B *1/04, 1/28, 15/04*

U.S. Cl. 239—18 8 Claims



8. Screen forming apparatus comprising:

a first pipe of a predetermined length;

a pump for conveying a working fluid under pressure to said first pipe;

a plurality of nozzles for ejecting working fluid so as to form a screen, said nozzles being placed along the longitudinal direction of said first pipe at predetermined intervals;

recovering means spaced from and facing said first pipe for recovering working fluid ejected from said nozzles; and

wherein said working fluid includes whitish, non-transparent gas.

5,067,654

PRESSURE WASHER

Clive R. Paige, Berkshire, England, assignor to Shop Vac Corporation, Williamsport, Pa.

Continuation of Ser. No. 297,620, Jan. 17, 1989, abandoned. This application Sep. 4, 1990, Ser. No. 577,801

Int. Cl.[5] F04B *49/00*

U.S. Cl. 239—124 21 Claims

1. A pressure washer for delivering liquid under pressure, the pressure washer comprising:

an outlet pressure spray nozzle for spraying liquid; an outlet conduit connected for delivering liquid eventually to the outlet pressure spray nozzle;

an inlet conduit for receiving liquid from a liquid supply;

at least one pumping means connected between the inlet conduit and the outlet conduit and operable for continuously pumping liquid from the inlet conduit to the outlet conduit;

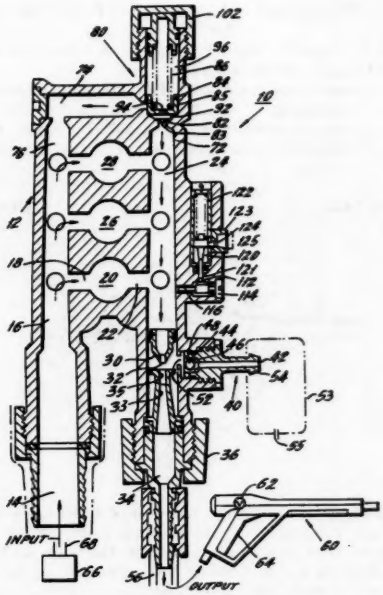
spray controlling means for selectively permitting exit of liquid pumped by the pumping means from the outlet conduit and through the pressure spray nozzle and for blocking exit of the continuously pumped liquid from the outlet conduit and through the pressure spray nozzle;

a flow recirculation bypass conduit connected between the inlet conduit and the outlet conduit in parallel to the connections to the inlet and the outlet conduits of each pumping means;

a bypass valve in the bypass conduit for selectively closing and opening the bypass conduit, the bypass valve including a bypass valve seat in the bypass conduit such that flow in the bypass conduit passes the bypass valve seat; a bypass valve element movable toward and liftable away from the bypass valve seat; the bypass valve element being so shaped and the outlet and bypass conduits being so positioned that the valve element may be raised up to a first distance off the bypass valve seat and still substantially block direct liquid flow between the outlet conduit and the bypass conduit;

the bypass valve element being shaped for defining a liquid leakage pathway past the bypass valve element and to an area outside the outlet and the bypass conduits, the liquid leakage pathway being of sufficient size that liquid flowing up to a first flow rate value can pass through the leakage pathway;

bypass biasing means for urging the bypass valve element toward the bypass valve seat at a force such that liquid flowing at a flow rate below the first flow rate value will not raise the bypass valve element more than the first distance to avoid opening communication between the outlet conduit and the bypass conduit;



the bypass valve element communicating through the bypass valve seat with the outlet conduit such that with the spray controlling means permitting exit of liquid through the pressure nozzle, the pressure in the outlet conduit is at most a first pressure and the flow pumped into the outlet conduit is divided between the pressure nozzle and flowing past the bypass valve element at a rate below the first flow rate value, and the bypass biasing means permitting the bypass valve element to lift away from the valve seat to permit flow below the first flow rate to pass along the leakage pathway, and such that with the spray controlling means blocking exit of liquid through the pressure nozzle, the pumped flow in the outlet conduit flows through the bypass valve seat at a rate greater than the first flow rate value and that flow sufficiently raises the bypass valve element off the bypass valve seat against the bias of the bypass biasing means to establish liquid flow communication from the outlet conduit into the bypass conduit and from there into the inlet conduit for recycling liquid back to the pumping means.

5,067,655

WHIRL NOZZLE FOR ATOMIZING A LIQUID

Zoltan Farago, Ravenstein-Merchingen, and Tom Schork, Adelsheim, both of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt, Fed. Rep. of Germany

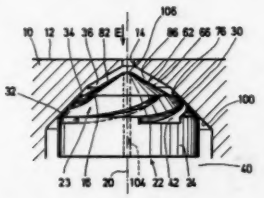
PCT No. PCT/EP88/01133, § 371 Date Sep. 20, 1989, § 102(e) Date Sep. 20, 1989, PCT Pub. No. WO89/05195, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 9, 1988, Ser. No. 393,907

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742015

Int. Cl.[5] B05B *1/34*

U.S. Cl. 239—124 15 Claims



1. A whirl nozzle for atomizing a liquid comprising:

a whirl chamber rising above a whirl chamber bottom and tapering towards a nozzle outlet orifice opposite said whirl chamber bottom;

an external component comprising said nozzle outlet orifice and an adjoining recess extending along a central axis and exhibiting a larger cross-section as it progresses further,

said recess having wall surfaces forming the lateral area of a conical frustum which is coaxial with said central axis,

a frustoconical internal component insertable into said recess in a positively connected manner and having said whirl chamber bottom extending perpendicularly to said central axis so that said whirl chamber bottom and said wall surfaces of said recess lying between aid whirl chamber bottom and said nozzle outlet orifice form a whirl chamber wall delimiting said whirl chamber,

said wall surfaces of said recess forming a conical seating surface for said frustoconical internal component,

said conical seating surface having a smaller apex angle than a section of said whirl chamber wall adjoining said nozzle outlet orifice,

at least one whirl channel laterally offset in relation to said central axis of said whirl chamber and opening into said whirl chamber,

a whirl parameter of >1,

a displacement element rising above said whirl chamber bottom to prevent formation of an air core in a region of said whirl chamber near said bottom,

said displacement element being arranged concentrically with said central axis,

said displacement element comprising a section near said bottom having an external diameter corresponding to at least one diameter of said nozzle outlet orifice.

5,067,656

AIR VOLUME BOOSTER FOR SPRAYERS

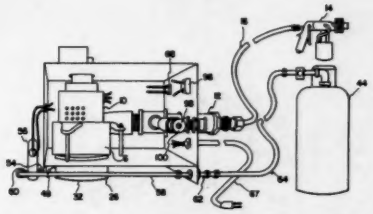
William H. Copp, Jr., 34-2 Sullivan Rd., North Billerica, Mass. 01862

Filed Mar. 15, 1990, Ser. No. 493,531

Int. Cl.[5] B05B *1/28;* F04B *23/00*

U.S. Cl. 239—290 10 Claims

1. An air supply system to provide a high volume of air at relatively low pressure having an air intake and an air outlet and a booster assembly to increase the volume of said relatively low pressure air at its said outlet, comprising first pressurized air supply means to provide a first supply of relatively low pressure air positioned between the said outlet and said intake of said air supply system, second pressurized air supply means comprising an air pressurizer and said booster assembly to provide a second supply of relatively low pressure air positioned between the said outlet and said intake of said air supply system, said booster assembly including volume-increasing-pressure-decreasing means to take in ambient air at atmospheric pressure while it takes in air at above atmospheric pressure from said air pressurizer to thereby increase the volume of air supplied by said booster assembly above that from said air pressurizer and lower the pressure of air supplied by said booster assembly below that from said air pressurizer, and coupling means to couple said first and second pressurizer air supply means together whereby the air discharged at said outlet is increased in volume to an extent greater than that provided by either said first pressurized air supply means or said second pressurized air supply means individually.



5,067,657

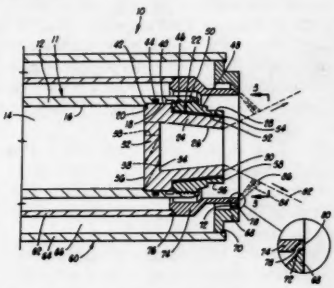
BURNER NOZZLE

Timothy M. Young, Copplee; Charles D. Coppedge, Euless; Charles S. McCasland, Westminster; and Joseph L. Pearce, Jr., Dallas, all of Tex., assignors to Halliburton Company, Duncan, Del.

Filed Nov. 1, 1989, Ser. No. 431,050

Int. Cl.[5] B05B *7/10*

U.S. Cl. 239—403 5 Claims



1. A petroleum burner nozzle comprising:

a tube portion defining a central opening therein and connectable to a fluid source;

a nozzle insert disposed in said central opening of said tube portion and comprising:

a substantially conical nozzle portion; and

a wall portion integrally formed with said nozzle portion and extending substantially perpendicular to a central axis of said tube portion, said wall portion defining a plurality of fluid inlet ports therethrough in communication with said nozzle portion;

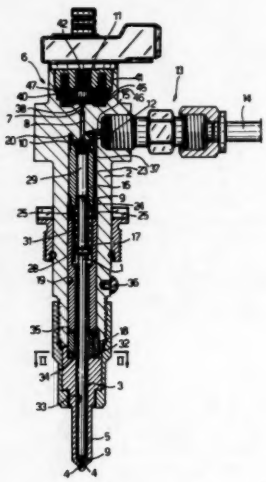
fastening means for holding said insert in place, said fastening means being disposed radially outwardly of said insert and being characterized by a nut having a substantially conical inner surface; and

sealing means for sealing between said insert and said tube portion.

5,067,658
DIESEL ENGINE ELECTROMAGNETIC FUEL INJECTOR

Sisto L. De Matthaeis, Modugno, and Mario Sfarzetta, Palo Del Colle, both of Italy, assignors to Weber S.r.l., Turin, Italy

Filed Feb. 27, 1990, Ser. No. 485,574
Claims priority, application Italy, Feb. 28, 1989, 67134A/89
Int. Cl.[5] F02M *51/00*
U.S. Cl. 239—533.8 5 Claims



1. A diesel engine electromagnetic fuel injector comprising:

a plunger sliding inside an injector body, for controlling fuel passage between an injection chamber, supplied with the fuel under pressure, and at least one injection orifice formed in an injection nozzle secured to said body;

an electromagnetic fuel metering valve for controlling fuel passage, through a drain orifice, between a control chamber, supplied with the fuel under pressure, and a low-pressure chamber, also as to reduce the pressure of the fuel in said control chamber by draining the fuel through said drain orifice; and

a plurality of sleeves including a top sleeve, and intermediate sleeve, and a bottom sleeve, said intermediate sleeve housing a spring coaxial with said plunger and designed to secure said plunger in a position wherein said plunger closes said injection orifice;

surface portions of said plunger being exposed to the fuel inside said injection chamber and said control chamber, so that the pressures inside said chambers and acting on said surface portions displace said plunger when the pressure in said control chamber falls to a given valve;

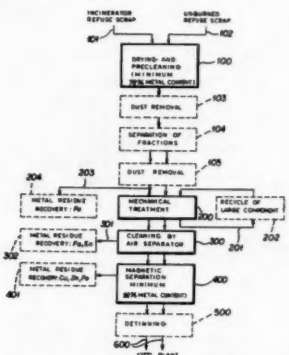
said fuel under pressure being supplied to said injection chamber and said control chamber by means of a single fitting connected to a supply pipe a supply orifice said fitting communicating with form in said body, said supply orifice B, communicating with said control chamber and with a supply duct for feeding fuel into said injection chamber;

said duct for supplying fuel to said injection chamber comprising an annular cavity formed in said body, coaxial with an axial hole formed in said body and inside which said plunger slides axially, and said fuel supply orifice terminating inside said annular cavity; an axial groove formed in said top sleeve; a first annular chamber formed between said tap and intermediate sleeves and said body; and at least one radially hole formed in said intermediate sleeve.

5,067,659
METHOD OF TREATING REFUSE SCRAP

Evert Heeren, Weener, and Hans Gotthelf, Schwerte, both of Fed. Rep. of Germany, assignors to Hoesch Werke AG, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 785,098, Oct. 4, 1985, abandoned, which is a continuation of Ser. No. 544,403, Oct. 21, 1983, abandoned. This application Aug. 13, 1990, Ser. No. 566,842
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239135
Int. Cl.[5] B02C *23/08*
U.S. Cl. 241—19 6 Claims



1. A method of converting municipal refuse into a product suitable for use as iron scrap in a blast furnace, said method comprising in the following order the steps of:

(a) processing the municipal refuse in a waste-treatment plant by classifying and comminuting the refuse, thereby producing treated refuse scrap;

(b) drying and precleaning said treated refuse scrap sufficiently such that a scrap product whose metal content is in excess of 70% by weight is produced;

(c) mechanically comminuting and abrading said scrap product with a shredder operating at about 60% to 70% maximum capacity, thereby reducing the scrap product to particles and also simultaneously removing material of metallic surfaces of the particles by rubbing the particles together;

(d) air separating said particles, thereby producing a heavy product and a light product;

(e) magnetically separating said heavy product thereby recovering a magnetically separable particle fraction having a metal content of at least 90% by weight and a bulk density of at least 1.0 ton/m^3; and

(f) introducing said magnetically separable particle fraction into the blast furnace as iron scrap.

5,067,660
STRESS REGULATOR FOR PULP GRINDING APPARATUS AND METHOD

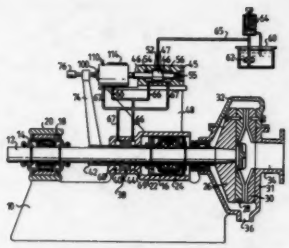
Rolf B. Reinhall, Bellevue, Wash., assignor to Sunds Defibrator AB, Sundsvall, Sweden

Continuation of Ser. No. 425,347, Sep. 27, 1989, abandoned, which is a continuation of Ser. No. 228,526, Aug. 4, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 598,796
Int. Cl.[5] B02C *7/14*
U.S. Cl. 241—37 19 Claims

1. In a grinding apparatus having a pair of opposed relatively rotatable grinding surfaces defining a grinding space therebetween, a servo mechanism for adjusting said grinding space, and first means coupled to said servo mechanism for actuating said servo mechanism, said first means including a pilot element fixedly mounted relative to said servo mechanism and a

set screw for adjusting a preset distance between said grinding surfaces, said set screw being movable with said servo mechanism, and said first means having a central axis, the improvement comprising:

second means for actuating said servo mechanism comprising a regulator including a resilient element and a regulator piston driven by said resilient element, said regulator piston having a central axis, and said regulator being disposed between said pilot element and said set screw of said first means,



said regulator piston being coupled to said first means and oriented therewith such that said central axis of said first means is aligned with said central axis of said regulator piston, for conjoint movement of said regulator piston and said first means in the same direction, said movement of said regulator piston corresponding to displacement of at least one of said grinding surfaces,

said regulator adapted to maintain said grinding space between said grinding surfaces at said preset distance.

5,067,661

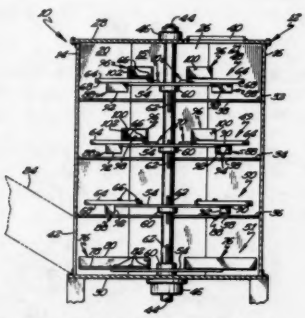
MILL FOR GRINDING GARBAGE OR THE LIKE

Russel L. Eide, Mondovi, Wis., assignor to Light Work Inc., New Underwood, S. Dak.

Filed Jul. 10, 1989, Ser. No. 377,712

Int. Cl.[5] B02C *13/09*

U.S. Cl. 241—55 **19 Claims**



1. Mill for processing material such as garbage comprising, in combination: a housing defining a grinding chamber having an inlet opening and an outlet opening; a plurality of substantially planar shelves secured in the housing and dividing the grinding chamber into sections, with each of the planar shelves including a centrally located aperture having a size; a shaft rotatably mounted in the grinding chamber and concentrically within the centrally located apertures of the planar shelves; a plurality of grinding rotors rotatably fixed to the shaft and located complementary to and intermediate the inlet opening and the plurality of planar shelves, with each of the rotors comprising a planar disc of a size smaller than the centrally located aperture of the planar shelf and a plurality of planar arms rotationally fixed to and extending radially from the planar disc and circumferentially spaced from each other, with the radial extent of the planar arms extending past the centrally located apertures of the planar shelf and over the planar shelf so that the material passing beyond the radial extent of the planar arms passes between the radial extent of the planar arms and the housing and between the planar arms and the planar shelves before passing through the centrally located apertures of the planar shelves, with the planar disc and planar arms being parallel to the planar shelf; an impeller rotor rotatably fixed to the shaft and located intermediate the plurality of grinding rotors and the outlet opening, with the impeller rotor creating a windage for blowing the ground material from the grinding rotors out the outlet opening; and means on the grinding rotors for creating a downward movement of air towards the impeller rotor for enhancing the creation of a vacuum by the impeller rotor and the movement of light weight ground material around and between the arms of the grinder rotors and through the centrally located apertures of the shelves through the mill.

5,067,662

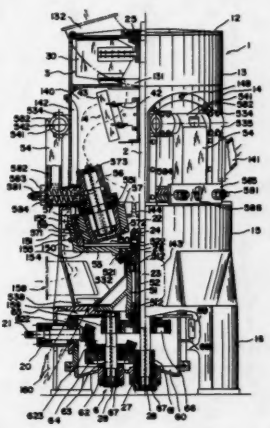
BOWL TYPE GRINDING MILL

Shien F. Chang, 150 West 51st, Suite 806, New York, N.Y. 10019

Continuation-in-part of Ser. No. 348,028, May 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 316,160, Feb. 28, 1989, abandoned. This application Jun. 28, 1990, Ser. No. 545,032

Int. Cl.[5] B02C *23/30*

U.S. Cl. 241—56 **8 Claims**



1. A grinding mill comprising a mill cylinder, a vertically mounted main shaft coupled at the lower end to a motor mounted on the lower side of the mill cylinder to be driven thereby and extending along the axis of the mill cylinder, and means mounted in descending order on the main shaft including a finished product conveying means, a classifying means, a grinding roller means and a decelerating means, a fixed sleeve fixed on the bottom of the mill cylinder to support a rotary bushing by means of bearings, a circular seat portion and a support seat fixed to the upper end of the rotary bushing, wherein the support seat is fixed with a grinding ring, a plurality of grinding rollers are rotatably provided inward of the grinding ring, a clearance is formed between the grinding ring and the grinding rollers, wherein a plurality of radially extended sweeping sheets are provided outside of the circular seat portion for sweeping the material fallen upon it away from the mill, and wherein an air inlet duct is provided at the inner surface of the mill cylinder for directing air into a grinding chamber, wherein the grinding roller means is provided at a

central section of the mill cylinder, characterized in that at least one inspection door is provided on the mill cylinder, the inspection door is hingedly secured with a grinding roller support plate which extends radially inwardly from outside of the inspection door for supporting the grinding roller, a pressurizing means is provided on the grinding roller support plate.

5,067,663

DRUM-TYPE WINDER FOR WINDING WEBS OF MATERIAL

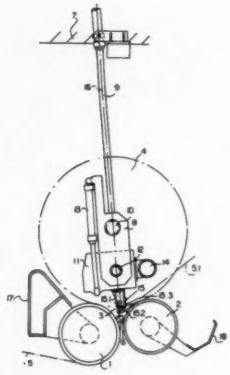
Hartmut Dropczynski, Dormagen, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 24, 1990, Ser. No. 469,621

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904598

Int. Cl.[5] B65H *19/20*

U.S. Cl. 242—56 R 6 Claims



1. A drum-type winder comprising:

a stationary frame;

a pair of winding drums defining a space therebetween for accommodating a core onto which a web of material is wound into a roll;

a pair of vertically movable cheeks carried by the frame and positioned above said space, the pair of cheeks being spaced apart on opposite sides of the web and being rotatably connected together by a shaft;

a piston and cylinder unit connected to the pair of cheeks for raising and lowering the cheeks into and out of said space;

an arm having at least two sides pivotably connected between the pair of cheeks;

a pressure-application roller secured to one side of the arm;

a mechanism for separating the web from a wound roll and fastening the newly-created initial web section to a new core, the separating and fastening mechanism being secured to another side of the arm; and

means for alternately pivoting the pressure-application roller and the separating and fastening mechanism about a pivot axis parallel to the shaft whereby the pressure-application roller and the separating and fastening mechanism are alternatively introduced into said space by actuation of the pivoting means.

5,067,664

PHOTOSENSITIVE SHEET POSITIONING DEVICE

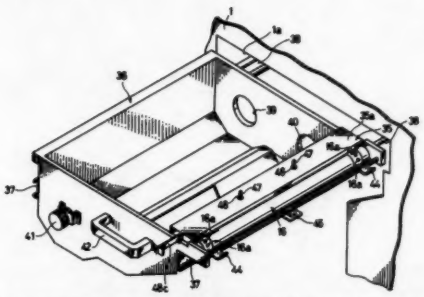
Kazuhiro Matsuyama, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1990, Ser. No. 489,490

Claims priority, application Japan, Mar. 7, 1989, 1-25637

Int. Cl.[5] B65H *16/00*

U.S. Cl. 242—67.2 6 Claims



1. A photosensitive sheet positioning device used in an image forming apparatus provided with a removable photosensitive sheet unit having a front side wall and a rear side wall and capable of containing a photosensitive sheet wound in a roll, a leader sheet attached to a leading edge of the photosensitive sheet, forwarding holes formed in a line inward from each of the longitudinal sides of the leader sheet, and a forwarding roller having a portion near each end, each of the portions having an outer circumferential surface from which forwarding pins radially protrude, the forwarding pins being successively fitted into the forwarding holes to control the forwarding direction of the photosensitive sheet, comprising:

fastening holes formed on a forefront portion of the leader sheet spaced from said forwarding holes toward a center of said leader sheet; and a fastening pin assembly operatively mounted between said roll of said photosensitive sheet and said forwarding roller to restrict the motion of the leader sheet by selectively engaging said fastening holes.

5,067,665

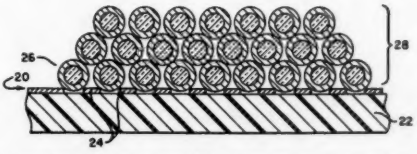
BASE LAYER FOR AN OPTICAL FIBER WOUND PACK

Gregory LoStracco, and George W. LeCompte, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 13, 1990, Ser. No. 611,811

Int. Cl.[5] B65H *75/18, 75/10*

U.S. Cl. 242—118.32 14 Claims



1. A winding form on which a filament pack is wound for properly positioning the individual turns in the innermost layer of said pack, comprising:

a mandrel having a smooth outwardly directed peripheral surface;

a flexible sheetlike support means having flat smooth opposite major surfaces one of which is disposed in intimate contacting relation with the mandrel smooth outwardly directed peripheral surface;

a plurality of parallel spaced apart guides on an outwardly direct major surface of said support means defining spaces

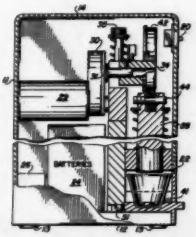
therebetween for receiving a first layer of the filament wound within said spaces.

5,067,666

PORTABLE PILL CRUSHER

David P. Sussman, 7356 E. Pheasant Run, Scottsdale, Ariz. 85258

Filed Jan. 3, 1991, Ser. No. 637,181
Int. Cl.[5] B02C *1/00*
U.S. Cl. 241—36 8 Claims



1. A portable pill crusher comprising in combination: a housing; a pill receptacle moveable into and out of said housing and adapted to secure a pill therewithin; a pill disposed in said container; motor means operatively mounted in said housing and selectively activatable to produce a power output; cam means mounted in said housing to enable the perimeter thereof to provide an eccentric path of rotation, ram means being operatively associated with said cam means and reactive to said perimetric path of eccentric rotation of said cam means to reciprocate within said housing into and out of said receptacle disposed axially therebeneath; and spring means circumscribing said ram means to constantly urge said ram means in an upward direction and, when said cam means disengages said ram means, force said ram means into its uppermost position.

5,067,667

AIRCRAFT OPTIMIZATION INDICIA AND THE USE THEREOF

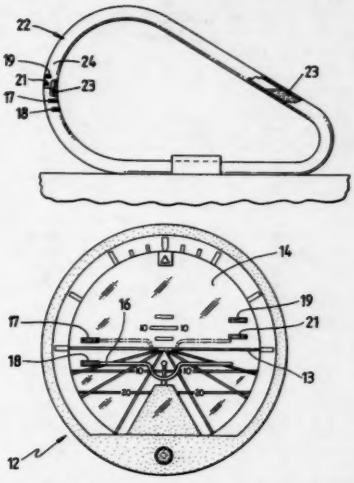
Charles B. Shivers, Jr., 816 S. 82nd St., Birmingham, Ala. 35203

Filed Jul. 23, 1990, Ser. No. 556,829
Int. Cl.[5] G01C *21/00*; G01D *13/24*
U.S. Cl. 244—1 R 12 Claims

1. Apparatus for providing visual cues to an aviator in an aircraft to indicate proper pitch values in descent and ascent comprising, in combination with an artificial horizon indicator:

(a) first indicating means detachably affixable proximal said artificial horizon indicia for indicating pitch at zero sink perceived by the aviator in a power off glide;

(b) second indicating means detachably affixable proximal said artificial horizon indicia for indicating pitch at stall in a power off glide; such that said aviator may adjust the power supplied to his aircraft to maintain level flight with said artificial horizon indicia aligned with said first means to achieve maximum range or with said artificial horizon



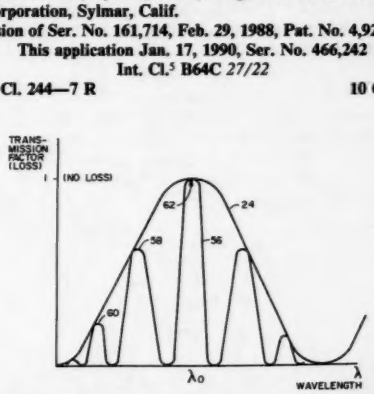
indicia centered between said first and second means to achieve maximum endurance.

5,067,668

COMPOUND HELICOPTER WITH NO TAIL ROTOR

Daniel R. Zuck, Sylmar, Calif., assignor to Y&B Investment Corporation, Sylmar, Calif.

Division of Ser. No. 161,714, Feb. 29, 1988, Pat. No. 4,928,907.
This application Jan. 17, 1990, Ser. No. 466,242
Int. Cl.[5] B64C *27/22*
U.S. Cl. 244—7 R 10 Claims



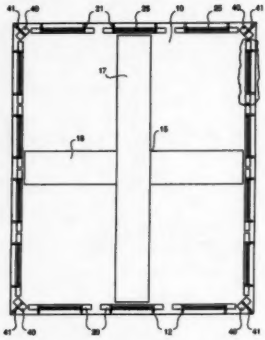
1. In combination a compound helicopter comprising a fuselage with left and right interconnected lifting wings on a horizontal axis for rotation by aerodynamic means and ailerons, and linkage means against differential wing rotation responsive to the direction of vertical airflow for yaw control and a lifting rotor, a fuselage body with a small diameter aft extending tail boom, the aft extended tail boom having an aerodynamically streamlined fairing vertically downward tilted at an angle vertically in a direction to produce aerodynamic anti-torque directional moments in the vertical downflow of the air from the rotor for transitioning to airplane mode.

5,067,669

PORTABLE LANDING ZONE FOR HELICOPTERS

Jesse A. Van Horn, Alexandria, Ind., and Linda L. Van Horn, Yule Apts., D-30, Alexandria, Ind. 46001, assignors to Linda L. Van Horn, Alexandria, Ind.

Filed Jan. 2, 1991, Ser. No. 636,889
Int. Cl.[5] B64F *1/00*
U.S. Cl. 244—114 R 12 Claims



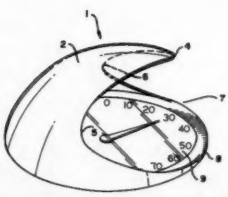
1. Portable helicopter landing zone, comprising:
a generally rectangular flexible sheet having an upper surface;
a flexible sheet target;
means for attaching said sheet target to said upper surface;
a plurality of bar masses;
four bag masses;
means for removably attaching said bar masses to said sheet so that said bar masses are disposed in contact with said upper surface and proximate to and generally parallel with the edges of said sheet; and
means for removably attaching said bag masses to said sheet so that said bag masses are disposed in contact with said upper surface and one of said bag masses is disposed proximate to each corner of said sheet.

5,067,670

FLIGHT TRAINING DEVICE FOR AIRCRAFT

Michael Radcliffe, 720 Ranas St., Elko, Nev. 89801

Filed Aug. 8, 1990, Ser. No. 564,066
Int. Cl.[5] B60K *37/06;* B62D *25/14*
U.S. Cl. 244—119 6 Claims



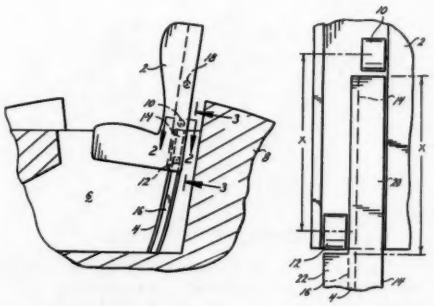
1. A controlled visibility device for mounting on an instrument panel of an aircraft to control the vision of a pilot operating the aircraft and to simulate failure of one or more instruments, comprising:
a substantially planar base having an open area and adapted to be mounted over an individual instrument on an aircraft instrument panel; and,
a dome having a planar lower rim affixed to said base, said dome having an opening on a lateral side, said opening having a sufficiently large projected area to permit viewing substantially the entire inner circumferential portion of the base from a position adjacent the opening.

5,067,671

ANTI TIP-OFF EJECTION RAILS

Robert G. McIntyre, Manhattan Beach, and Brad Mastrolia, Buena Park, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 26, 1990, Ser. No. 498,394
Int. Cl.[5] B64D *11/06, 11/112*
U.S. Cl. 244—122 AH 16 Claims



1. A structure that guides an ejection seat out of a vehicle, comprising:
a) at least one first guide attached to said ejection seat at a predetermined point;
b) at least one second guide attached to said ejection seat at a point which is lower than said predetermined point by a predetermined distance; and
c) at least one rail attached to said vehicle, said rail having a first channel and a second channel, said first guide residing within said first channel and said second guide residing within said second channel, said first and second guides being adapted to travel along said first and second channels respectively, and to exit from said channels at the ends of said channels, the end of said first channel being at a distance from the end of said second channel approximately equal to the predetermined distance that separates said first and second guides, such that when said ejection seat travels along said rail, said first and second guides disengage from said first and second channels essentially simultaneously.

5,067,672

METHOD OF PLACING A GEOSTATIONARY TELECOMMUNICAITON SATELLITE IN ORBIT

Charles Bouzat, Ramonville, France, assignor to Alcatel Espace, Courbevoie, France

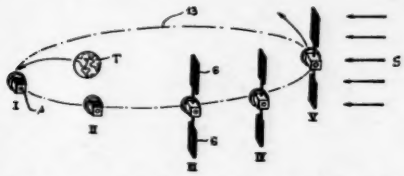
Filed Apr. 24, 1990, Ser. No. 514,063
Claims priority, application France, Apr. 24, 1989, 89 05403
Int. Cl.[5] B64G *1/20*
U.S. Cl. 244—158 R 8 Claims

1. In a method of placing a geostationary telecommunication satellite having a steerable payload mounted on a platform in a circular final orbit comprising the following successive steps:
injecting the satellite in a three-axis stabilized attitude substantially corresponding to an apogee maneuver attitude into an elliptical transfer orbit;
powering up an inertia momentum wheel;

eliminating aiming errors;

preparing for apogee maneuver into the circular orbit by powering up the inertia momentum wheel with the rotation of the axis of the momentum wheel aligned with the thrust axis of an apogee thruster to a speed sufficient to obtain gyroscopic stiffness;

pointing a configuration comprising said platform at all times towards the sun and steering said payload on said platform at all times pointed towards the earth;



at least partially deploying the solar panels of a solar generator;

eliminating angular speeds by reducing the nutation;

carrying out at least one apogee burn near the apogee of the transfer orbit with the satellite orientation controlled during the apogee burn to obtain final circular orbit; and

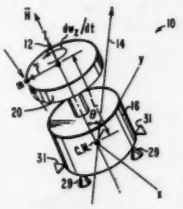
when the final circular orbit is achieved, after one or more apogee burns, allowing the satellite to drift in the conventional way into its final orbital position.

5,067,673

ESSENTIALLY PASSIVE METHOD FOR INVERTING THE ORIENTATION OF A DUAL SPIN SPACECRAFT

Herbert S. Fong, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 7, 1990, Ser. No. 477,274
Int. Cl.[5] B64G *1/28, 1/24*
U.S. Cl. 244—165 **13 Claims**



1. A method for at least substantially inverting the orientation of a dual spin spacecraft, the spacecraft including a gyroscopic spinning rotor rotatably coupled via a despin motor and bearing assembly to a despun platform, the spin axis of the spacecraft being its minimum moment of inertia axis, the method including the steps of:

determining whether or not said spacecraft is nutationally stable, and practicing the remaining steps only if it is determined that said spacecraft is nutationally stable;

controlling said despin motor in such a manner as to accelerate rotation of said despun platform and decelerate rotation of said rotor, to thereby generate, via product of inertia coupling, a transverse torque perpendicular to said spin axis;

wherein said transverse torque is of sufficient magnitude to temporarily destabilize said spacecraft and cause said spin axis to diverge and precess towards a flat spin orientation, whereby said spacecraft spin axis becomes the maximum moment of inertia axis of said spacecraft; and,

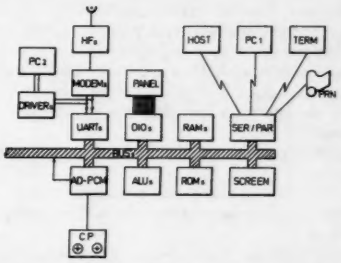
continuing to practice said controlling step, to thereby cause said spacecraft spin axis to precess through said flat spin orientation towards a final, inverted orientation.

5,067,674

CONTROL SYSTEM FOR REMOTE CONTROLLED AIRCRAFT

Albert Heyche; Alain Latteur, and Philippe Dekoninck, all of Brussels, Belgium, assignors to Vigilant, Ltd., St. Helier, United Kingdom

Filed Dec. 4, 1990, Ser. No. 621,994
Claims priority, application France, Dec. 4, 1989, 89 16088
Int. Cl.[5] B64C *13/20;* F41G *7/30*
U.S. Cl. 244—190 **4 Claims**



1. A system for controlling a remote controlled aircraft equipped with servomotors for carrying out different functions, said system comprising a substructure for piloting from a distance and an on-board apparatus mounted on the aircraft,

said piloting substructure comprising:

a piloting console (CP) adapted to deliver analog piloting signals,

an analog/digital conversion unit (A/D-PCM) for converting said piloting signals into digital data,

a volatile memory unit (RAM_s) for storing the digital data,

a central computing unit (ALU_s) for carrying out logical operations on the stored data according to predetermined operating programs,

a non-volatile memory unit (ROM_s) containing the operating programs for the central unit (ALU_s),

an asynchronous communication module ($UART_s$)adapted to transform the data issued from the computing unit into a serial signal, and for converting a serial signal received and loading the corresponding data into an internal register accessible by the central unit (ALU_s),

a modulation/demodulation unit ($MODEM_s$) adapted to modulate the serial signal issued from the module ($UART_s$) and demodulate the modulated signals and transmit them to said module ($UART_s$),

a radio transmitting/receiving module (HF_s) for amplifying and transmitting the modulated signals issued from the unit ($MODEM_s$) and receiving the modulated signals emitted by the on-board apparatus,

a binary input/output port (DIO_s) driven or controlled by the central unit (ALU_s),

a set of binary actuators and sensors (PANEL) states directed or controlled by the port (DIO_s),

a series/parallel communication module (SER/PAR) adapted to provide exchanges of data between the central unit (ALU_s) and the peripherals, in particular a personal computer (PC_1), a pocket terminal (TERM), a printer (PRN), a host computer (HOST),

said on-board apparatus comprising:

a radio transmitting/receiving module (HF_e), forming with the module (HF_s) a hertzian bundle, and adapted to transmit and receive modulated signals,

a modulation/demodulation unit ($MODEM_{em}$) adapted to modulate a serial signal and transmit it to the module (HF_e), and the demodulate the signals coming from this module (HF_e),

an asynchronous communication module ($UART_{em}$) adapted to transform data into a serial signal and trans-

mit the same toward the unit ($MODEM_e$), and for converting the serial signal from the unit ($MODEM_e$) and loading the corresponding data into an internal register,

a volatile memory unit (RAM_{em}) for storing the digital data,

a central computing unit (ALU_{em}) for providing logical operations on the stored data, said unit having access to the internal register of the module ($UART_{em}$),

a non-volatile memory unit (ROM_{em}) containing the operating programs for the central unit (ALU_{em}),

a digital/analog conversion unit (D/A-PCM) adapted to generate a composite analog command signal from the data treated by the computing unit,

a demodulator (DEM) adapted to receive the aforementioned composite signal and deliver to each servo-motor of the aircraft a simple analog signal understandable thereby,

a binary input/output port (DIO_{me}) commanded or controlled by the central unit (ALU_{me}),

an assembly of binary actuators and sensors (DACT) having states ordered or controlled by the port (DIO_{me}),

an assembly of sensors (IMAG) comprising in particular inclinometers, a magnetometer, accelerometers, gyrometers, an altimeter, a speed indicator, tachometer, a fuel gauge, alternator load indicator, able to furnish analog signals representative of the position, operation and internal parameters of the aircraft,

a multichannel analog/digital convertor (A/D_e) for converting the analog signals from the sensors (IMAG) into digital data and placing the data into the memory unit (RAM_{em}),

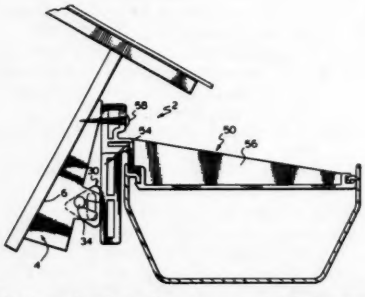
a universal interface (UPI) for providing exchanges of data between the central unit (ALU_{me}) and the peripherals (AUX), in particular an auxiliary processor.

5,067,675

FASCIA ANGLE ADAPTER FOR AN EAVESTROUGH SYSTEM

Anthony W. Brant, Minesing, Canada, assignor to GSW Inc., Canada

Filed Aug. 13, 1990, Ser. No. 565,970
Int. Cl.[5] E04D *13/06*
U.S. Cl. 248—48.2 **20 Claims**



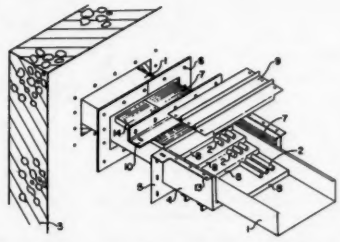
1. A fascia angle adapter for an eavestrough system comprising a base member having a fascia engaging surface and a second surface opposite said fascia engaging surface adapted to support a mounting base of an eavestrough hanger, said fascia engaging surface and said second surface being angled to define a shallow wedge, said component further including an eccentric cam rotatably supported by said base member and projecting forwardly of said second surface, said cam being rotatable within said base member to various positions to define a support surface for an eavestrough hanger.

5,067,676

SYSTEM FOR THE PREVENTION OF FIRE, WATER OR FLUE GAS AND THE LIKE FROM PROPAGATING ALONG CABLES

Johannes A. Beele, Ke Opmeer, Netherlands, assignor to CSD International B.V., Opmeer, Netherlands

Filed Apr. 10, 1990, Ser. No. 507,268
Int. Cl.[5] F16L *5/00*
U.S. Cl. 248—56 **12 Claims**



1. A safety chute system for the prevention of fire, water, or gas from propagating along cables contained in an open top channel shaped lead-through chute passing through a wall, said safety chute system comprising:

(a) an open top channel shaped housing positioned in spaced surrounding relation with said lead-through chute externally of said wall and with the open top of the lead-through chute facing outwardly of the open top of the safety chute;

(b) at least one sealing body of fire resisting material removably positioned in the space between the two chutes; and

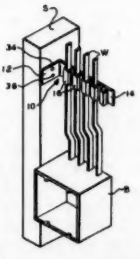
(c) cover means for covering the open top of the safety chute to fully enclose the lead-through chute therein.

5,067,677

WIRE HARNESS

Edward Miceli, 595 Lake Pochung Rd., Sussex, N.J. 07461

Filed Dec. 14, 1990, Ser. No. 627,248
Int. Cl.[5] F16L *3/22*
U.S. Cl. 248—68.1 **19 Claims**



1. A wire harness for supporting wires from a face of a stud between two external surfaces of a wall, comprising:

a plurality of wire clips having a plurality of barriers spaced for embracing therebetween one or more of said wires; and

an L-shaped bracket having two perpendicular arms, said plurality of wire clips being mounted on one of said arm, the other one of said arms having

mounting means for securing said bracket to the face of said stud, said mounting means being arranged to align said clips in a row that lies in a plane perpendicular to the face of said stud at a central location between said external surfaces of said wall, said mounting means being arranged to set said row perpendicular to the face of said stud, said

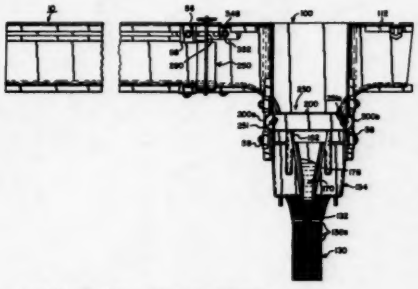
plurality of clips each having an opening axis aligned to support each of the wires in a direction that is mutually orthogonal to the length of said arms of said bracket.

5,067,678

OPTIC CABLE MANAGEMENT SYSTEM

Roy L. Henneberger, Eagan; Ronald M. Weitnauer, Excelsior, and Wayne A. Johnson, Rosemount, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Jul. 31, 1989, Ser. No. 387,978
Int. Cl.[5] H02G *3/04*
U.S. Cl. 248—68.1 **9 Claims**



1. A cable routing system comprising:
a plurality of troughs having a plurality of walls, cooperating to define a cable pathway;
said trough having at least one attachment member secured to at least one of said plurality of walls;
said attachment member having cooperating surfaces sized to receive a mounting bracket of predetermined dimensions;
said attachment member extending along the length of said wall, with said member selected to present said cooperating surfaces at any one of a plurality of locations along a longitudinal dimension of said wall;
a take-off union having a main body portion with first wall means defining a body cable pathway extending between first and second body ends;
attachment means for attaching said body ends to said trough, with said body cable pathway connecting a cable pathway of said trough,
said main body having second wall means defining an outlet in communication with said body cable pathway;
a flexible conduit having at least a first free end;
attaching means for attaching said first free end to said outlet, with said conduit disposed to receive a cable, said attaching means including inner wall means opposing said second wall means, said conduit disposed with said first free end between said inner and second wall means with an exterior of said conduit opposing said second wall means and with said inner wall means opposing an interior of said conduit, means for urging said inner wall means toward said second wall means whereby said conduit is captures between said inner and second wall means.

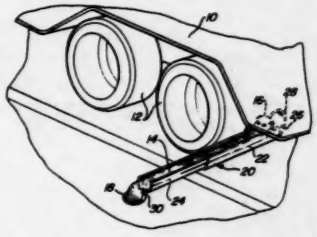
5,067,679

FLEXIBLE WASTE HOSE SUPPORT FOR RECREATIONAL VEHICLES

Charles H. Courtney, 2970 Gardner, Berkley, Mich. 48072

Filed Dec. 6, 1990, Ser. No. 623,198
Int. Cl.[5] A62C *13/76*
U.S. Cl. 248—75 **25 Claims**

1. A flexible waste hose support comprising:
a first trough-like member having a first end and a second end, said first trough-like member including integral tracks formed along substantially the entire length at its upper edges;
a second trough-like member having a first end and a second end, wherein said first trough-like member receives said second trough-like member at the second end of the first trough-like member and the first end of the second trough-like member in a telescoping fashion such that the upper edges of the second trough-like member engage within the integral tracks in a friction fit;



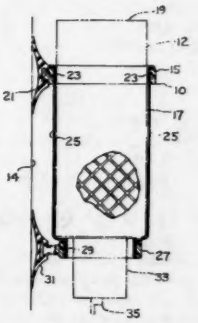
hoop means secured proximate to the first end of said first trough-like member for connecting said first end of said first trough-like member to a vehicle proximate a waste outlet of said vehicle; and
a wire hook rigidly connected to a bottom portion of the second trough-like member proximate the second end of the second trough-like member.

5,067,680

SHAMPOO BOTTLE SUPPORT DEVICE

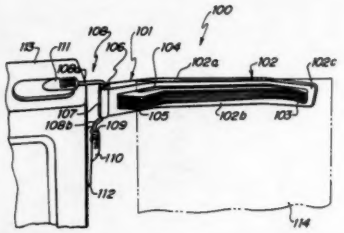
Wayne C. Miller, 5745 Whitman Ter., Pennsauken, N.J. 08109

Filed Jan. 30, 1991, Ser. No. 648,029
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.3 **2 Claims**



1. A device for suspending a squeeze bottle of liquid hair shampoo upside down on a shower wall: said device comprising an upper annular circular ring adapted to encircle a squeeze bottle; a first single suction cup extending laterally from said upper ring for suction engagement with a shower wall; a lower annular circular ring adapted to encircle the neck area of a squeeze bottle, said lower ring having a smaller diameter than said upper ring so that the circumscribed bottle cannot slip downwardly through the rings; a second single suction cup extending laterally from said lower ring for suction engagement with a shower wall; and a flexible open-ended tubular sock extending between the two rings to encircle a squeeze bottle; the flexibility of the sock being such that a person can apply a squeeze pressure through the sock and onto the bottle, thereby causing liquid shampoo to be discharged downwardly out of the bottle; said flexible open-ended sock being formed of an open mesh fabric material such that the shampoo bottle is visible through the sock.

5,067,681
COPY HOLDER
Ali Huang; Philips Tsai, and Bonbo Chen, all of Taipei, Taiwan, assignors to Acer Incorporated, Hsin Chu, Taiwan
Filed Dec. 13, 1989, Ser. No. 450,000
Int. Cl.[5] A47F *37/14*
U.S. Cl. 248—442.2 **5 Claims**



1. A holder for holding at least one sheet of paper in an upright position for exhibiting the information contained thereon, said holder comprising:

an elongated clip adapted for clipping an end of the sheet of paper thereto, said elongated clip having, a first end and a second end, said first end forming a cylinder, said cylinder having an axis and being split along a substantially axial direction to form an opening; and

supporting means for supporting said elongated clip, said supporting means including a rod being removably inserted into said cylinder via said opening, said supporting means comprising:

a first attachment member connected to a first end of said rod and adhering to a first surface, and

a second attachment member connected to a second end of said rod and adhering to a second surface, said first end of said rod being substantially perpendicular to said second end of said rod.

5,067,682
BOOK HOLDER
Davy J. Figaro, 9304 Ferguson Ct., Sebastopol, Calif. 95472
Filed Jul. 10, 1989, Ser. No. 377,261
Int. Cl.[5] A47B *97/04*
U.S. Cl. 248—453 **7 Claims**

1. A reading stand for supporting reading material in a position for examination comprising:

(a) a swinging-assembly of sufficient rigidity and size to support up to almost any size of reading material, said swinging-assembly being substantially "L" shaped and having a horizontal book-support element and a vertical-swing element;

(b) clip means located on an end of said horizontal book-support away from said vertical-swing element to provide pressure on the pages of an open book;

(c) a stand having one front panel or face with upper and lower ends for receiving said swinging-assembly, said stand being at an angle with respect to a horizontal surface;

(d) pivotal attachment means attached on the end of said vertical-swing element away from the book-support element, and to the upper end of said front panel or face wherein the vertical-swing can swing closer and further to said face, and such that said book support lies below the lower end of the face, and protudes in front of said face at a substantially perpendicular angle during the entire swing;

(e) tension means between said clip means and said book support means for applying a closing force on said clip;

(f) wherein the reading material may be placed with its backside leaning against the front of said face, with the bottom of the reading material upon the book-support,

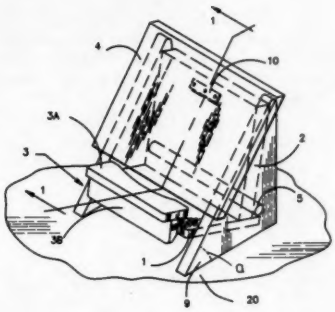
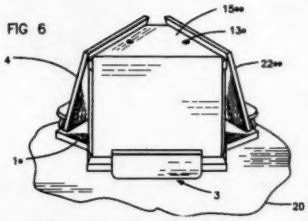
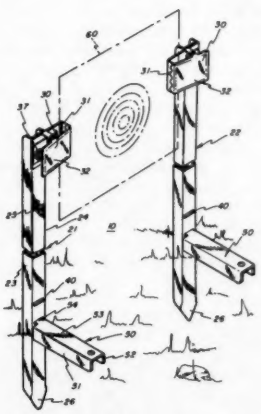


FIG 6



and said swinging-assembly adjusting to a different material thickness.

5,067,683
PORTABLE TARGET HOLDER
Alan M. Wager, Centerville, Ohio, assignor to Quickfire, Inc., Centerville, Ohio
Filed Jan. 8, 1991, Ser. No. 638,866
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—545 **3 Claims**



1. A portable target holder comprising:

an elongated stake having upper and lower ends and a channel shaped cross-section defined by a pair of side walls interconnected by a generally planar back wall; one of said walls being provided with a slot near the lower end thereof for releasibly receiving a tongue of a stepping bar; and said side walls being tapered at said lower end for

facilitating insertion of said stake into the ground in response to a stepping action on said stepping bar, and

a spring jaw clamp pivotally mounted on said back wall near said upper end for selective sideward facing to clamp a first sideward edge of a target in cooperative supporting relationship with an oppositely facing spring jaw clamp mounted on another elongated stake and gripping a second sideward edge of said target.

5,067,684

VIBRATION-ISOLATING MACHINE MOUNT

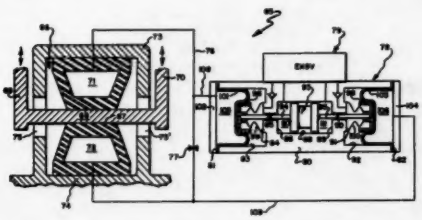
Kenneth D. Garnjost, Buffalo, N.Y., assignor to Moog Inc., East Aurora, N.Y.

PCT No. PCT/US88/04628, § 371 Date Feb. 16, 1990, § 102(e) Date Feb. 16, 1990

PCT Filed Dec. 22, 1988, Ser. No. 555,530

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—550 **16 Claims**



1. In a suspension having one mass arranged to move relatively toward and away from another mass, and having a spring an damper arranged in parallel with one another to act between said masses, said damper having first and second opposed chambers communicating with one another through a restricted orifice, the improvement which comprises:

fluid displacement generating means operatively arranged to selectively create a desired net pressure differentail across said orifice, said fluid generating means including a fluid pump having opposide first and second chambers, said pump first chamber communicating with said damper first chamber and said pump second chamber communicating with said damper second chamber, each of said chambers being filled with fluid, and an actuator operatively arranged to controllable vary the volumes of said pump chambers to create said net pressure differential across said orifice.

5,067,685

MODULAR ELECTRICAL BOX MOUNTING SYSTEM

Robert G. Johnston, Jr., Pompano Beach, Fla., assignor to Fibrelon, Inc., Pompano Beach, Fla.

Continuation-in-part of Ser. No. 402,568, Sep. 5, 1985. This application Aug. 6, 1990, Ser. No. 564,284

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] F16M *13/00*

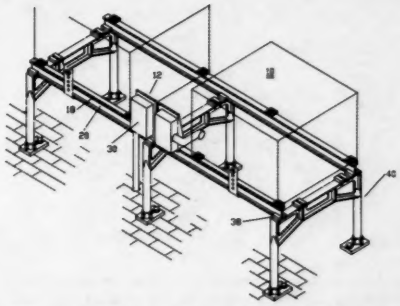
U.S. Cl. 248—676 **4 Claims**

1. A support system for an electrical box, comprising:

(a) at least one I-beam, each beam having a top, a base parallel to said top, and a rib normally integrally connecting said top and said base of said I-beam, the bottom of said I-beam proportioned for complemental, securable slideable re-positionable engagement with a first female track means positioned upon a structure;

(b) a modular electrical box mounting means having a female track proportioned for complemental, securable, slideable engagement with said top of said I-beam, said electrical box mounting means further having, in an upright surface thereof, openings proportioned for securement with an electrical connector box; and

(c) at least two parallel space-apart trusses, each of said trusses having a pair of legs, which legs define lateral edges of each truss, each of said trusses having a linear top edge extending between those lines comprising longitudinal axes of said legs, said top edge having a transverse width, each of said edges having a plurality of second female track means, each of said track means having axes normal to said linear edge of each of said trusses, said second female track means proportioned for complemental slideable engagement with said base of said I-beam.



5,067,686

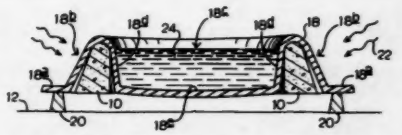
ANNULAR BASE MOLD

Daryl Peterson, 1002 Chenowith, N. Bonneville, Wash. 98639

Division of Ser. No. 128,813, Dec. 4, 1987, Pat. No. 4,905,945. This application Mar. 2, 1990, Ser. No. 487,632

Int. Cl.[5] B28B *7/06*

U.S. Cl. 249—57 **2 Claims**



1. A unitary mold for producing from casting compound a generally circular annular base for use on a generally horizontal supporting surface, the mold comprising:

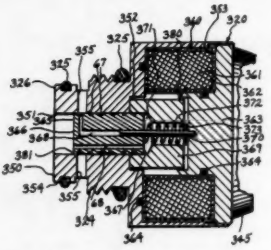
a flexible, shape-retentive base forming means including a generally circular planar region lying in a defined plane and a generally circular annular recess for receiving the casting compound, said recess circumscribing said circular planar region, said recess being dimensioned to extend from said defined plane to a predefined depth equal to the desired height of the base and said circular planar region having a diameter equal to the desired inside diameter of the base, said recess having a generally right-cylindrical inner wall roundly joined, at the greatest depth of said recess, at an acute angle of intersection with a frusto-conical outer wall, said base forming means being sufficiently flexible to enable said inner wall to flex inwardly with flexure of said circular planar region, said outer wall terminating in said defined plane and being joined thereat with a generally planar annular expanse lying generally in said defined plane, extending radially outwardly from said base forming means and at least semicircumferentially around said base forming means, said planar annular expanse at least semicircumferentially joining said outer wall at the greatest radial extent of said outer wall, said planar annular expanse extending radially a distance sufficient to provide manual purchase for gripping and inverting the mold thereby to release the base of its own weight.

5,067,687

PROPORTIONAL PRESSURE CONTROL VALVE

Kishor J. Patel, Mukwonago, and Thomas J. Stobbs, West Allis, both of Wis., assignors to Applied Power Inc., Butler, Wis.

Filed Feb. 8, 1990, Ser. No. 477,026
Int. Cl.[5] F16K *31/06*; F16F *9/46*
U.S. Cl. 251—129.08 8 Claims



1. A proportional pressure control valve, comprising:

a housing having a driver cavity, a main bore and ports connecting said main bore to a pressure source and a low pressure tank;

an electromagnetic driver mounted within said driver cavity, said electromagnetic driver having:

an armature movable within said driver cavity; and

an electromagnetic force source associated with said armature, said electromagnetic force source being operable to receive a variable input current and to establish a magnetic flux path through said armature to move the same, the strength of said magnetic flux path being substantially proportional to said variable input current; and

a metering spool positioned within said main bore and movable in an infinitely variable manner between a sealing position, where communication between said pressure source and said tank is prevented, and an infinite number of open positions, where communication between said pressure source and said tank is permitted, the position of said metering spool in said open positions determining in part the magnitude of communication between said pressure source and said tank;

means for biasing said metering spool within said main bore;

means for applying a pressure feedback force on said metering spool; and

means for connecting said armature and said metering spool so that said armature and said metering spool move in concert;

wherein said metering spool has a first face, an opposite second face and an axial channel between said first and second faces; and

the surface area of said first face is greater than that of said second face.

5,067,688

SOLENOID VALVE

Yoshimitsu Tanimoto, Himeji, and Akitoshi Kamada, Sanda, both of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 7, 1990, Ser. No. 609,856
Claims priority, application Japan, Nov. 9, 1989, 1-293211
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.18 3 Claims

1. A solenoid valve comprising:

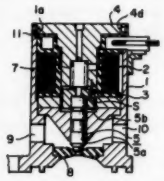
a casing (1);

a coil (2) wound around a bobbin and housed within said casing;

an initially axially adjustable and thereafter stationary iron core (4) disposed within said casing, extending into said bobbin having a radially inward recess (4*d*);

a plunger (5) capable of being magnetically attracted toward said stationary iron core upon energization of said coil, and a spring (7) for biasing said plunger away from said iron core, a gap (S) being defined between confronting portions of said plunger and said iron core; and

means for fixing the axially adjusted position of said iron core to attendantly fix said gap at a predetermined dimension, said fixing means including a radially inwardly deformable member contiguous with said casing and extendable into said radially inward recess of said stationary iron core, for anchoring said core in an axial direction relative to said casing.

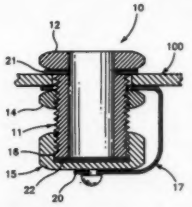


5,067,689

TRANSMISSION DRAIN PLUG

Harry C. Phipps, 504 Old State Rd., Pevely, Mo. 63070

Filed Feb. 8, 1991, Ser. No. 652,988
Int. Cl.[5] F16K *51/00*; B65D *41/04*
U.S. Cl. 251—144 3 Claims



3. A valve for draining fluids from a vehicle transmission fluid pan comprising:

a. an externally threaded tubular valve placed through a port in the transmission fluid pan;

b. a bolt head on one end of the tubular valve;

c. an internally threaded lock nut threadingly placed on the tubular valve to secure the tubular valve to the transmission fluid pan;

d. an internally threaded end cap threadingly placed on another end of the tubular valve distal the bolt head to seal and unseal the other end of the tubular valve;

e. a retaining spring strap having a loop on one end through which the tubular valve is placed;

f. another end of the strap being rotatively connected to the end cap to suspend the end cap away from the tubular valve;

g. a first seal on the tubular valve between the bolt head and the transmission fluid pan; and

h. a second seal in the end cap.

5,067,690

SELF-CLOSING DEVICE FOR CONNECTING CONTAINERS

Jean-Claude Bac, Le Petit Couronne, France, assignor to Aerazur, France

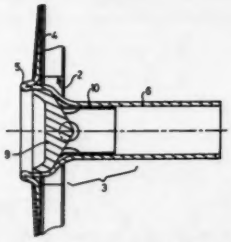
Filed Mar. 2, 1990, Ser. No. 487,475
Claims priority, application France, Mar. 3, 1989, 89 02947
Int. Cl.[5] F16L *37/28*
U.S. Cl. 251—149.8 9 Claims

1. Device for self-sealing connection between plural containers, at least a first of said containers having and a flexible wall

with an internal wall surface bearing against a partition pierced with a bore, which comprises:

(a) a flexible connecting sleeve having an end fixed to said internal wall surface of said first of said containers and around said opening thereof, said connecting sleeve presenting a fold within said first container and having a cylindrical barrel at the opposite end thereof which passes through said bore of said partition and is connected to another of said plural containers;

(b) a tube section and a sealing element disposed within said



first container comprising a jamming element contained by said tube section force fitted into said cylindrical barrel in the vicinity of said fold, said tube section having holes therethrough through which a container fluid can freely flow from one of said containers to another of said containers;

(c) said fold of said connecting sleeve turning back over said holes of said tube section responsive to a tractive force exerted on said cylindrical barrel of said connecting sleeve tending to move said containers apart to cause an irreversible sealing of the connection.

5,067,691

BALL COCK

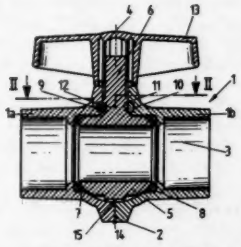
Bruno Hunziker, Stetten, and Peter Kunz, Schaffhausen, both of Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed Nov. 30, 1990, Ser. No. 621,024

Claims priority, application Switzerland, Dec. 4, 1989, 04331/89

Int. Cl.[5] F16K *5/06*

U.S. Cl. 251—315 **9 Claims**



1. In a ball cock including a housing of a thermoplastic material, the housing being composed of two housing parts which are integrally connected to each other along a plane of separation in an inseparable and tight manner, a ball plug mounted in the housing, the ball plug being connected integrally with a pivot of plastics material, the housing defining a passage opening and a bore extending transversely of the passage opening, the pivot being mounted in the bore, the pivot having an axis of rotation, and a sealing means for sealing the pivot, the improvement comprising the plane of separation of the two housing parts extending transversely of the passage opening and through the axis of rotation of the pivot, the two housing parts each defining recesses at least in the region of the sealing means for the pivot, a component being mounted in the recesses, the component being integrally connected in a tight manner with the two housing parts.

5,067,692

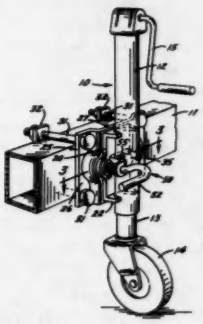
SWIVEL JACK FOR A TRAILER TONGUE

Barry C. Nudd, and James W. Chambers, both of Rockford, Ill., assignors to Atwood Industries, Inc., Rockford, Ill.

Filed Jun. 4, 1990, Ser. No. 532,875

Int. Cl.[5] B60S *9/02*

U.S. Cl. 254—420 **10 Claims**



1. A jack adapted to be attached to a generally horizontal trailer tongue and adapted to be selectively located in an upright active position or in a generally horizontal stowed position, said jack comprising an elongated tubular housing, a housing bracket fixed to said housing and having inner and outer sides with a hole of predetermined diameter extending therebetween, a tongue bracket adapted to be anchored to said tongue and having inner and outer sides with a hole of larger diameter extending therebetween, the inner side of said housing bracket being disposed in opposing relation with the outer side of said tongue bracket, means connecting said housing bracket to said tongue bracket for pivoting of the housing bracket about a generally horizontal axis extending transversely of said tongue thereby to support said jack for movement between said positions, said means comprising a spacer disposed in said hole in said tongue bracket with close rotatable clearance and having an opening therethrough, a bolt having a head located adjacent the outer side of said housing bracket and having a shank extending through said hole in said housing bracket and through said opening in said spacer, said spacer and said housing bracket being connected to rotate in unison, a washer encircling said shank and located adjacent the inner side of said tongue bracket, said washer having a diameter greater than the diameter of the hole in said tongue bracket, and a nut threaded on said shank and coacting with said head to hold said washer, said spacer and said housing bracket in assembled relation, said spacer holding said housing bracket and said washer out of clamping engagement with said tongue bracket.

5,067,693

ELECTRIC ARC OVEN FOR TREATING MOLTEN METALS WITH A GAS AND A PROCESS THEREFOR

Etienne Lepoutre, Hinsdale, Ill.; Michel Devaux, Magny-les-Hameaux, France; Bruno Hirschberg, Vienna, Austria; Franz A. Petio, Kindberg, Austria, and Paul Weitzer, Vienna, Austria

Filed Mar. 13, 1990, Ser. No. 492,140

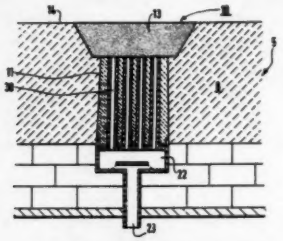
Claims priority, application France, Mar. 15, 1989, 89 03381

Int. Cl.[5] C21B *13/00*

U.S. Cl. 266—44 **19 Claims**

1. A process of melting scrap iron by injecting an inert gas in

molten metal present in a sole of an electric arc oven, by means of at least one device for injecting an insert gas, said gas being fed into the molten metal by first passing through a low injector embedded in the refractory material of the sole, then through a layer of porous rammed earth of an initial thickness between 50 and 300 mm, consisting of an unshaped refractory



material made of granular particles having a particle size distribution of: 0 to 0.5 mm: about 30% by weight, 0.5 to 2 mm: about 30% by weight, 2 to 5 mm: about 40% by weight and allowing gas to pass therethrough under a feeding pressure of at most 10 bars and a flow rate of at least 20 Nm^3/h after fritting under heat.

5,067,694

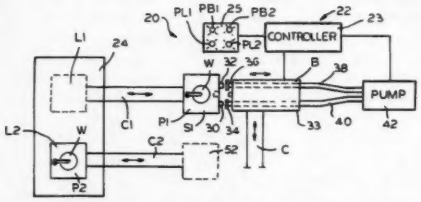
AUTOMATIC COUPLING SYSTEM

Dann B. Rypka, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Continuation of Ser. No. 194,329, May 16, 1988, abandoned. This application Jun. 28, 1990, Ser. No. 545,751

Int. Cl.[5] B23Q *3/00*

U.S. Cl. 269—20 **17 Claims**



1. In a system including a base unit having a first connector and a satellite unit having a second connector connectable with said first connector, an apparatus for automatically connecting said first and second connectors comprising:

a cam ring having a central axial opening surrounded by a plurality of helical cam portions;

mounting means for mounting said cam ring to said satellite unit in spaced parallel relation with said second connector;

an elongated locking rod having a diameter smaller than the diameter of said central opening and a plurality of radially outwardly extending and axially spaced locking pins;

actuable means connected to said locking rod for providing axial and rotational movement thereof;

carriage means for axially slideably mounting said first connector and said actuable means to said base unit so that said locking rod and said first connector are in spaced parallel relation similar to the spacing provided by said mounting means; and

control means connected to said actuable means for sequentially reciprocally axially moving said locking rod whereby said reciprocal movement causes said rod to selectively pass inwardly and outwardly through said axial opening so that said pin selectively engage said cam portions to rotate said locking rod and to thereby controllably slideably move said carriage means toward or away from said satellite unit to connect or disconnect said first and second connectors.

5,067,695

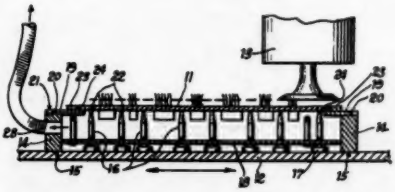
CIRCUIT BOARD SUPPORT APPARATUS FOR USE WITH CIRCUIT BOARD LEAD TRIMMER

Brent D. Huddleston, Kuna, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 8, 1989, Ser. No. 349,046

Int. Cl.[5] B25B *11/00*

U.S. Cl. 269—21 **12 Claims**



1. A support apparatus for a through-hole soldered circuit board having an unpopulated perimeter during the lead-trimming process, said apparatus designed for use in conjunction with a circuit board lead trimming machine of the type having a planarly-movable cutting head and a base plate below the cutting head parallel to its plane of movement, comprising:

(a) a perimeter frame of uniform height, the lower surface of which is rigidly and hermetically affixed to the base plate of the lead trimming machine;

a plurality of removable equal-height support posts, each having a board-support apex and a base. perpendicular to its associated post;

(c) a support post positioning plate having upper and lower surfaces and a plurality of supportpost-positioning apertures, the center of each aperture, when viewed from the positioning plate's lower surface, corresponding dimensionally to a safe, planar position on the populated side of a circuit board to be lead trimmed, into each of which apertures, one of said support posts can be slidably inserted from the positioning plate's lower surface with minimal play, said positioning plate accurately positionable within said frame such that each support post inserted in its respective aperture is accurately and

vertically positioned with its associated base in contact with the base plate of the lead trimming machine;

(d) means associated with the lead trimming machine baseplate for securely maintaining in position each accurately positioned support post;

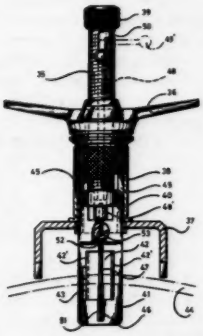
(e) a circuit board support plate having a cutout which is smaller, but proportionally similar to the profile of the circuit board to be lead trimmed, said support plate being accurately and hermetically affixed to the top of said perimeter frame such that the upper surface of said support plate is essentially equiplanar with a plane which passes through the apices of said support posts following the positioning said support posts on said base plate utilizing said positioning plate, and said support plate also having circuit board positioning means so that when the circuit board to be lead trimmed is resting on inner edges of the cut-out, the circuit board is positioned such that the apices of said support posts contact the safe, planar positions on the populated side of the circuit board to be lead trimmed.

5,067,696

DEVICE FOR CLAMPING TWO METAL OBJECTS WHICH ARE TO BE WELDED TOGETHER

Allen D. Morley, Merellaan 48, B-2080 Kapellen, Belgium

Continuation of Ser. No. 230,879, Aug. 11, 1988, abandoned.
This application Feb. 27, 1991, Ser. No. 661,663
Claims priority, application Netherlands, Sep. 18, 1987, 8702239
Int. Cl.[5] B23Q 1/00
U.S. Cl. 269—49 19 Claims



1. A device for clamping two metal objects relative to each other at opposite end edges wherein the metal objects are to be welded to each other at said edges, in such a way that the end edges are held at a particular distance from each other, with a predetermined space between said edges said device comprising:

a draw bolt provided with an external screw thread and a central axis;

an element forming a tension nut screwed onto the draw bolt having a lower side with a contact face;

a bridge piece having an opening through which the draw bolt passes with a slight clearance and having a contact face which engages the tension nut contact face;

object engaging parts of said bridge piece being located at the bottom thereof a portion of said object engaging parts lying in one flat plane such that each of the object engaging parts engages one of said opposite end edges on a first surface thereof and said bridge piece spans said predetermined space;

a clamping plate at one end of the draw bolt having a top edge facing the tension nut and forming a radially extending shoulders which can be engaged with a second side of each of the objects to be welded together on either side of the space between the end edges thereof;

a relatively thin blade-shaped member being insertable into said predetermined space and being connected to said draw bolt, said blade-shaped member having a window wherein said clamping plate is pivotably movable from a position in which said clamping plate lies flat inside the window so that said clamping plate extends substantially in the same plane as the blade-shaped member, to a position substantially perpendicular to said plane and vice-versa:

at least one element connected to the draw bolt above the clamping plate which forms at least one protuberance projecting outwards at right angles to the central axis of the draw bolt; and

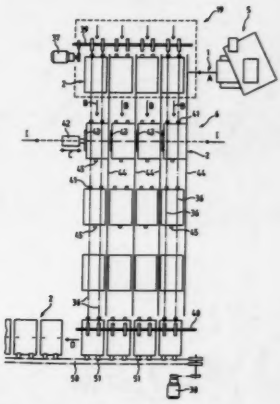
guide means of said bridge piece for guiding said protuberance in such a way that an up and down movement on the draw bolt relative to the bridge piece is permitted, but rotary movements of the draw bolt about its central axis are prevents.

5,067,697

METHOD AND MEANS FOR TABLOID FURTHER PROCESSING

Werner Honegger, Tann Rüi, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Aug. 17, 1989, Ser. No. 394,879
Claims priority, application Switzerland, Sep. 9, 1988, 338288
Int. Cl.[5] B41L 43/12
U.S. Cl. 270—37 19 Claims



1. A method of conveying and processing tabloids and other folded printed products in a processing system which includes a plurality of spaced conversion stations, the method comprising the steps of

delivering a serial sequence of folded printed products to a conversion station,

at the conversion stations, extracting a plurality of starting products from spaced stations along the sequence and combining the products to form clusters including the extracted products, each cluster including at least two printed products, the step of extracting further including removing the products from the sequence with a gripper for forming each cluster,

conveying the clusters away from the conversion stations,

repeating the step of extracting, forming and conveying the clusters to thereby create a plurality of streams of products being conveyed in parallel,

conveying the streams of clusters of products to a processing location, and

processing the products while they are in the clusters.

5,067,698

METHOD AND APPARATUS FOR MANUFACTURING INTERFOLDED TOWELING

Kurt Stemmler, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany

Filed Sep. 8, 1989, Ser. No. 404,845
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1988, 3832595
Int. Cl.[5] B41L 1/32
U.S. Cl. 270—39 21 Claims

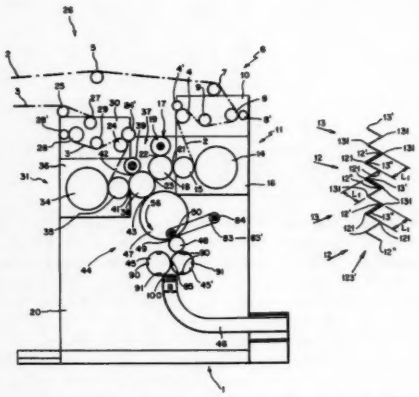
1. A method for manufacturing toweling interfolded in a zigzag manner particularly partially overlapping, interfolded toweling folded "n" times, wherein "n" is an even number or an odd number, by an interfolder having two counter rotating folding rollers, said method comprising:

choosing "n" either as an even number or as an odd number;

alternately cutting sections of toweling of equal length from a first continuously advancing web of material and from a second continuously advancing web of material;

separating by accelerating each of said cut sections of toweling in the direction of advancement to a specified length;

reconducting together each said cut sections of toweling in an ordered first sequence such that said cut sections of toweling having an overlap which is adjustable and equal;



continuously folding said first sequence of cut sections of toweling in a zigzag manner into a second sequence; and

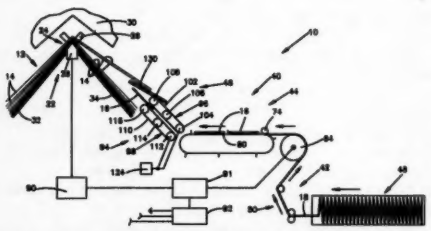
forming said second sequence of cut toweling folded in a zigzag manner into a folded stack.

5,067,699

SHEET MATERIAL HANDLING APPARATUS WITH INSERTER ASSEMBLY

Jeffrey G. Gadway, Dayton, and Robert Bryson, Sr., Huber Heights, both of Ohio, assignors to AM International Incorporated, Chicago, Ill.

Filed Feb. 7, 1990, Ser. No. 477,603
Int. Cl.[5] B65H *5/32*
U.S. Cl. 270—55 **21 Claims**



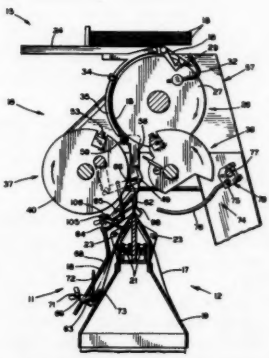
1. An apparatus for feeding inserts from interconnected inserts into collated assemblies of signatures disposed on a main conveyor, said apparatus comprising means for feeding a plurality of interconnected inserts toward the main conveyor, means for separating a leading insert from the plurality of interconnected inserts as the plurality of interconnected inserts is being fed toward the main conveyor, means for separating one of the signatures in a collated assembly of signatures on the main conveyor from an adjacent signature, and means for feeding the leading insert which was separated from the plurality of inserts into the collated assembly of signatures at a location between the one signature and the adjacent signature while they are separated, wherein said means for feeding a plurality of interconnected inserts toward the main conveyor includes means for moving the plurality of interconnected inserts at a first speed, said means for separating a leading insert from the plurality of interconnected inserts includes means for accelerating the leading insert from the first speed to a second speed which is greater than the first speed, said means for feeding the leading insert into the collated assembly of signatures including means for accelerating the leading insert from the second speed to a third speed which is greater than the second speed.

5,067,700

METHOD AND APPARATUS FOR ATTACHING INSERTS TO MOVING SHEETS

David L. Dick, Fostoria, Ohio, assignor to The Gray Printing Company, Fostoria, Ohio

Filed Aug. 10, 1990, Ser. No. 566,553
Int. Cl.[5] B65H *5/30*
U.S. Cl. 270—55 **25 Claims**



1. A portable insert handling apparatus for attachment to a signature feeding station, the signature feeding station including a support structure, feeding means for transferring signatures seriatim from a supply stack to a horizontally extending conveyor disposed therebelow, the feeding means including a roller assembly having a plurality of rotating disks axially mounted in spaced relationship on a shaft, the plurality of rotating disks having circumferential surfaces for supporting the signatures as the same are transferred from the supply stack to the horizontally extending conveyor, wherein the handling apparatus comprises:

a frame adapted for mounting on the support structure of the signature feeding station, said frame including a projecting member having one end affixed thereto and the other end disposed between an adjacent pair of the plurality of disks;

support means for supporting the insert in a generally horizontal disposition; and

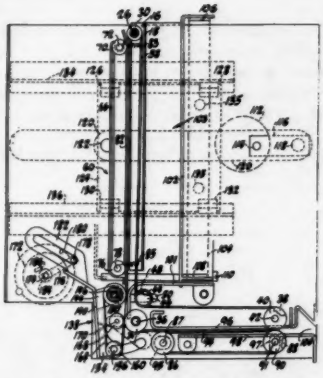
pressure means for engaging the insert supported on said support means.

5,067,701

MULTIPLE BILL ESCROW MECHANISM

Donald A. Dekker, Grand Rapids, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed Apr. 16, 1990, Ser. No. 509,900
Int. Cl.[5] B65H 5/22
U.S. Cl. 271—7 16 Claims



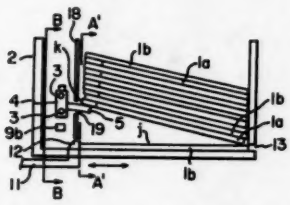
1. Apparatus for receiving and temporarily holding a plurality of successively received bills in an escrow position and for delivering said bills together from said escrow position including in combination interengageable first and second conveyor means adapted to receive bills therebetween, means mounting said first and second interengageable conveyor means for movement toward and away from each other, resilient means for biasing said first and second conveyor means toward each other, means for moving successively received bills into an escrow position between said first and second conveyor means against the action of said resilient biasing means to build up a plurality of bills in said escrow position at which said bills are clamped between said conveyor means by said biasing means and means for concomitantly driving both of said first and second conveyor means to move said plurality of bills out of said escrow position as a unit.

5,067,702

DISPENSER FOR DISPENSING SHEETS OF AN ALTERNATING FIRST AND SECOND KIND FROM A STACK

Katsuaki Muraishi; Masahiro Onishi; Nobufumi Mori, all of Kanagawa; Hiromi Nunome, and Tetsuo Oikawa, both of Tokyo, all of Japan, assignors to Jeol Ltd., Tokyo and Fuji Photo Film Co., Ltd., Kanagawa, both of, Japan

Filed May 25, 1990, Ser. No. 529,219
Claims priority, application Japan, May 29, 1989, 1-136480
Int. Cl.[5] B65H 3/50
U.S. Cl. 271—134 6 Claims



1. An apparatus for conveying sheets from a stack of sheets, comprising:

a housing accommodating a stack consisting of alternate sheets of first and second kinds stacked on top of each other, each sheet of the first kind having a first notch in a first position, each sheet of the second kind having a second notch in a second position;

a projection that supports one edge of the lowermost sheet of the stack to prevent the stack from falling to a takeout position at which the sheets of the stack are taken out, the projection being so mounted as to be movable along said edge;

a guide plate which is mounted in the housing and guides and aligns the edges of the sheets of the stack located upon the same side as the edge of the lowermost sheet which is supported upon the projection;

the guide plate defining a slot and through which slot the projection extends to support the edge of the lowermost sheet;

a driving means for moving the projection into a first stop position corresponding to the first notch and a second stop position corresponding to the second notch alternately, to permit only the lowermost one of the sheets of the stack to fall at a time; and

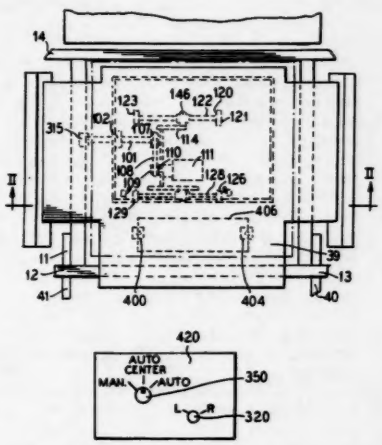
a means for taking the sheet placed in the takeout position out of the housing.

5,067,703

AUTOMATIC PALLET CENTERING DEVICE

Malcolm E. Keith, West Chicago, Ill., assignor to Midaco Corporation, Elk Grove Village, Ill.

Filed Aug. 20, 1990, Ser. No. 569,647
Int. Cl.[5] B65H 1/22
U.S. Cl. 271—164 2 Claims



1. A composite table for supporting sheets for a machine comprising an outer table, an inner table moveably mounted to said outer table so as to be moveable relative thereto, a reversible motor coupled to said outer and inner table so as too move them relative to each other, a bar mounted on said inner table, first and second spaced auto-centering switches mounted on said outer table and each engageable with said bar when said inner table is centered relative to said outer table, an auto-center switch for said first and second auto-centering switches in circuit with different windings of said reversible motor such that if said first auto-centering switch does not engage said bar it is closed to supply power to said reversible motor to rotate in a first direction to center said inner table relative to said outer table and said auto-center switch having an auto-center

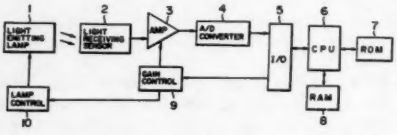
setting such that regardless of the vertical position of the composite table, the table will center itself.

5,067,704

DOUBLE-FEED SHEET DETECTION APPARATUS

Yutaka Tsuihiji, Tama, and Akio Sakayori, Zama, both of Japan, assignors to Tokyo Aircraft Instrument Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1990, Ser. No. 504,604
Int. Cl.[5] B65H 7/14
U.S. Cl. 271—262 **8 Claims**



1. A double-feed sheet detection apparatus comprising:

a light-transmission sensor wherein a paper transport path is constituted between a light emitting source and a light receiving sensor;

a light control circuit for controlling the intensity of said light emitting source;

a variable gain amplifier for amplifying sequential outputs of said light-transmission sensor; and

a central processing unit (CPU) for setting the intensity of said light emitting source and the gain of said variable gain amplifier, and for judging whether or not a double-feed has occurred based on the output of said variable gain amplifier, said central processing unit including:

means for initiating said detection apparatus when a sequential feeding operation is started;

means for temporarily setting the light intensity of said light emitting source and the gain of said variable gain amplifier;

means for adjusting the gain of said variable gain amplifier so that an output level of said variable gain amplifier may be a constant value, which is not in a saturation state, when no sheet of paper exists between said light emitting source and said light receiving sensor;

means for adjusting the output of said light emitting source so that, when a sheet of paper to be measured is supplied into said paper transport path, the output for the sheet of said variable gain amplifier may be on a medium level and lower than the level of the output of said variable gain amplifier during the period when no sheet is being fed;

means for transmitting a double-feed sheet detection output when an output lower than a fixed level, which is lower than the level during the period when the sheets are being fed, is detected in the sequential feeding operation; and

means for comparing sequential outputs of said variable gain amplifier while the sheets are being fed one by one and for increasing the output of said light emitting source when a reduction in the output is found.

5,067,705

PRINTER SHEET FEED APPARATUS WITH SINGLE DRIVER

Arthur C. Van Horne, Lake Oswego; Eldon P. Hoffman, West Linn, both of Oreg., and Paul D. Bakke, Tucson, Ariz., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 232,419, Aug. 15, 1988, Pat. No. 4,943,045.
This application Jun. 1, 1990, Ser. No. 531,731
Int. Cl.[5] B65H 5/04
U.S. Cl. 271—277 **5 Claims**

1. Apparatus for conveying a print medium sheet having a leading edge along a travel path through a printing zone where an image is printed on the sheet, said apparatus comprising:

means defining a support surface for supporting at least a portion of the sheet after it exits from the printing zone;

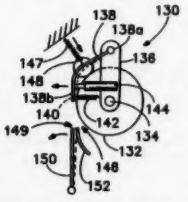
roller means disposed downstream on the sheet travel path from the printing zone adjacent to said support surface;

means for biasing said roller means toward said support surface for pressing a sheet passing between said roller means and said support surface against said support surface;

means defining an engaging surface facing said support surface;

means for moving said engaging surface between a non-grasping position spaced from said support surface for receiving and releasing a sheet therebetween, and a grasping position sufficiently near said support surface for grasping a sheet received therebetween; and

means for moving said support-surface and thereby for transporting said engaging surface between a load position



at the print zone and an unload position past said roller means while said engaging surface is in said grasping position, said engaging-surface moving means holding said engaging surface in said grasping position after receiving a sheet leading edge at said load position until the sheet leading edge is transported between said roller means and said support surface, said engaging-surface moving means then releasing the sheet leading edge by moving said engaging surface toward said unload position, whereby a grasped sheet is transported through the printing zone;

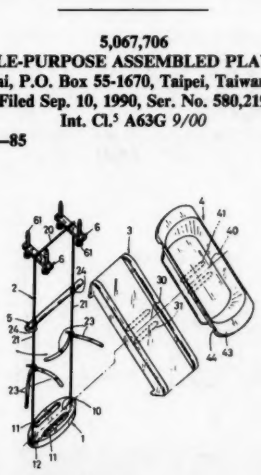
the engaging surface being movable back toward said load position after said engaging surface has been moved away from said support surface toward said non-grasping position by moving said engaging surface to said grasping position in contact with said support surface and said support-surface moving means moving said support surface.

5,067,706

MULTIPLE-PURPOSE ASSEMBLED PLAYING SET

Wen-Guo Tsai, P.O. Box 55-1670, Taipei, Taiwan

Filed Sep. 10, 1990, Ser. No. 580,219
Int. Cl.[5] A63G 9/00
U.S. Cl. 272—85 **8 Claims**



1. A playing set comprising:

a basic seat hanged on a rope which is mounted on an upper frame, having at least a groove formed in said seat;

a longitudinal plate having at least a first extension formed on a central bottom portion of said plate, said first extension detachably engageable with said groove in said seat, said longitudinal plate operatively biased about a central portion of said seat secured with said rope;

a basin having at least a second extension formed on a central bottom portion of said basin, said second extension detachably engageable with said groove of said seat; and

at least a bar horizontally transversely tied on said rope.

5,067,707

APPARATUS FOR RESPIRATORY TRAINING

Ole B. Køhnke, Hjortekrogen, Denmark, assignor to Ambu International A/S, Glostrup, Denmark

PCT No. PCT/DK89/00064, § 371 Date Nov. 22, 1989, § 102(e) Date Nov. 22, 1989, PCT Pub. No. WO89/09023, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 22, 1989, Ser. No. 435,445

Int. Cl.[5] A63B *23/00*

U.S. Cl. 272—99 **6 Claims**

1. A portable apparatus for respiratory training comprising:

(a) a mouthpiece,

(b) a respiration chamber communicating with said mouthpiece and comprising:

(i) a first opening comprising a one-way valve allowing inflow of inspiratory air and preventing outflow of expiratory air,

(ii) a second opening comprising a one-way valve allowing outflow of expiratory air and preventing inflow of inspiratory air,

(c) exchangeable obstruction means for varying the flow of air through he first and second openings,

(d) a manometer comprising a U-shaped flexible plastic tube for holding a liquid and a scale located between the two parallel tube sections of the manometer, said manometer having at its lowermost end a branch pipe for supplying liquid to and removing liquid from said manometer, said branch pipe comprising a valve, and

(e) a pipe stub extending from the mouthpiece and communicating with the upper end of one of the two tube sections, the upper end of the other tube section communicating with surrounding atmosphere.

5,067,708

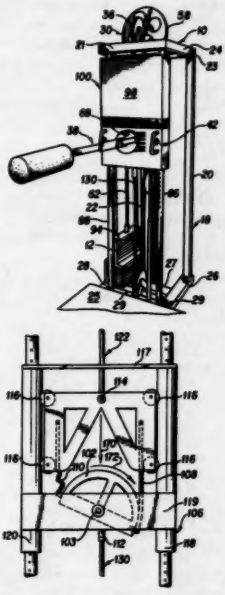
MULTI-FUNCTION EXERCISE SYSTEM

Brad Oschansky, Baltimore; Scott Olschansky, Towson, and Raymond H. Lee, Jr., Lutherville, all of Md., assignors to Lifeing, Inc., Pikesville, Md.

Filed Jun. 8, 1990, Ser. No. 534,879

Int. Cl.[5] A63B *21/062*

U.S. Cl. 272—118 **12 Claims**



1. An improved multi-function exercise system for reversibly displacing a predetermined weight load selected from a plurality of weight elements responsive to a lifting force imparted to said weight load by a user, comprising:

a base frame; and

force translation means displaceably coupled to said base frame and said selected weight elements for converting a rotative displacement force in either of two opposite directions imparted by the user into said lifting force, said translation means including:

(a) actuating bar means for applying said rotative displacement force in either of said two opposite directions;

(b) means for transforming a reversible rotational displacement of said actuating bar means to a displacement of said selected weight elements, said transforming means including a rotatably displaceable member coupled to said actuating bar means for rotation about an axis responsive to rotation of said actuating bar means in (1) a clockwise direction, and (2) a counter-clockwise direction, said rotatably displaceable member having a predetermined positional location, said displacement of said selected weight elements being in an identical direction when said rotatably displaceable member is rotatively displaced from said predetermined positional location in either said clockwise or counter-clockwise directions, said rotatably displaceable member having a pair of opposing ends equidistantly spaced from said rotation axis, said transforming means further including a pair of flexible linkage members, each of said pair of flexible linkage members being coupled on a first end to a respective one of said opposing ends of said rotatably displaceable member, said flexible linkage members having a second end coupled to a linear displaceable member, said linear displaceable member

being displaceable relative a positional location of said rotatably displaceable member from a first position to a second position responsive to rotation of said rotatably displaceable member from said predetermined positional location in either said clockwise or counter-clockwise directions;

(c) transmission means coupled to both said linear displaceable member and said selected weight elements for displacement thereof responsive to said rotative displacement of said rotatably displaceable member, said transmission means including flexible coupling means having a predetermined tension therein for coupling said selected weight elements to said linear displaceable member; and,

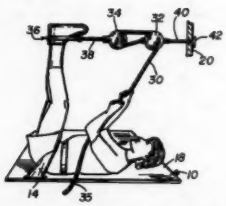
(d) vertical adjustment means releasably lockingly coupled to said base frame for adjusting the vertical positional location of said transforming means relative to said base frame.

5,067,709

UNASSISTED LOWER TORSO STRENGTHENING AND STRETCHING DEVICE

John Christianson, Milwaukee, Wis., assignor to Tarrenn Corporation, Brookfield, Wis.

Filed Nov. 29, 1989, Ser. No. 443,117
Int. Cl.[5] A63B *21/12*
U.S. Cl. 272—121 **4 Claims**



1. An unassisted lower torso strengthening and stretching device for a person comprising means for restraining the pelvis of the person while allowing upward tilting of the legs, and means operable by the user for raising and lowering the legs to a position where the legs are substantially perpendicular to the torso, said last mentioned means comprising a first pulley, means for supporting said first pulley above the person, a second pulley connected to the feet of the person, and a line having a free end operable by the user to raise and lower the legs, said line passing over the first pulley, around said second pulley, and the other end of said line being secured to said first pulley, said first pulley comprising means for allowing rotation thereof while pulling on said line, and means for preventing rotation thereof upon release of said line.

5,067,710

COMPUTERIZED EXERCISE MACHINE

Scott R. Watterson, Logan; George B. Bersonnet, River Heights; William T. Dalebout, and Michael Burk, both of Logan, all of Utah, assignors to Proform Fitness Products, Inc., Logan, Utah

Continuation-in-part of Ser. No. 306,872, Feb. 3, 1989, Pat. No. 4,998,725. This application Sep. 29, 1989, Ser. No. 415,160
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.
Int. Cl.[5] A63B *21/005*
U.S. Cl. 272—129 **18 Claims**

18. A computerized exercise machine comprising:

an exercise structure having a movable member for movement by a user to exercise on said exercise structure;

resistance means associated with said movable member to resist the movement of said movable member;

adjustment means mechanically associated with said resistance means for selectively varying the resistance of said resistance means;

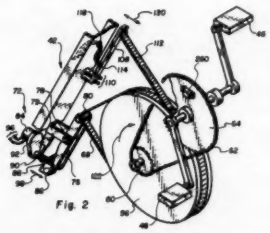
resistance sensing means associated with said resistance means for sensing work performed by said user in moving said movable member against said resistance and including:

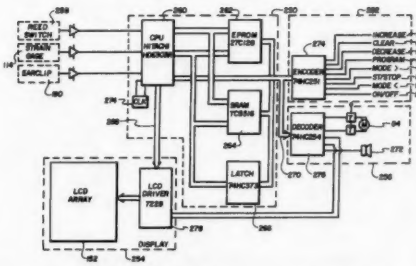
a resistance responsive element connected to said resistance means, said resistance responsive element undergoing deformation in response to changes in the resistance of said resistance means; and

a piezoelectric element adapted to said resistance responsive element, to generate a resistance signal reflective of said deformation;

a motion sensor mounted to said exercise structure to sense the rate of movement of said movable member and to provide a movement rate signal reflective thereof;

computer means associatively linked with said adjustment means for selectively controlling said adjustment means and communicatively linked to said resistance sensing means and said motion sensor to receive said resistance signal and said movement rate signal therefrom;





input means connected to said computer means for receiving background data from said user and for selecting an exercise program and at least one exercise parameter related to said selected program;

display means mounted on said exercise structure and associatively linked with said computer means for displaying data computed by said computer means;

wherein said computer means is operable to receive said selected exercise program and varying the resistance of said resistance means selected by said user from said input means, and

control said adjustment means in accordance with said selected exercise program and said varying resistance over a preselected program duration,

read said background data from said input means,

read the rate of movement of said movable member from said motion sensor,

read the resistance of said resistance means from said resistance sensing means, and

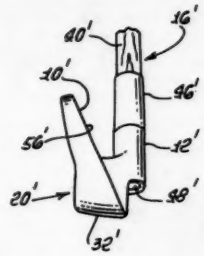
compute calorie use data from said background data, rate of movement, and resistances.

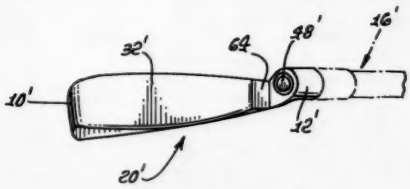
5,067,711

IRON GOLF CLUB HEADS

Richard E. Parente, Solana Beach; Richard De La Cruz, Pauma Valley, and Richard C. Helmstetter, Carlsbad, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation of Ser. No. 204,704, Apr. 10, 1989, Pat. No. 4,995,609. This application Aug. 31, 1990, Ser. No. 576,071
The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.
Int. Cl.[5] A63B 53/02
U.S. Cl. 273—77 A 16 Claims





5. The improvement in an iron golf club, comprising:

a) an iron golf club head having a sole and having a blade with a top, a toe end and a heel end, the heel end having an upper edge,

b) said head having a hosel disposed at said heel end of said blade in a position juxtaposed to said blade and formed from the same continuous piece of metal as an integral part lapping said heel end from said upper edge of said heel end downwardly and there being no bridge between said blade and said hosel below said hosel, said hosel extending from a level above the top of said blade down to said sole, said hosel having a top edge, a lower portion and a through bore of substantially constant diameter extending from said top edge of said hosel down through said sole, said hosel being solid and inflexible and having substantially even wall thickness from its lower portion to its top edge,

c) said hosel having a dog-leg which in developmental view of said sole taken from below, extends at an obtuse angle forwardly from said heel end of said blade,

d) said hosel having a lowermost end portion forming an angular, substantially flattened surface extending substantially above the plane containing the bottom sole of the club head below the level of said lowermost end portion of said hosel thereby reducing the weight of the metal of said hosel which can be redistributed to said blade, and said club head having a necked area near the plane of merger of said hosel and said blade having no greater than about a $\frac{3}{8}$ inch vertical dimension in face view of said club head,

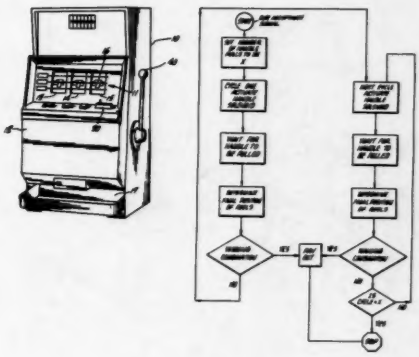
e) and a golf club shaft fixedly secured within said bore and inflexible relative to said hosel and extending substantially completely to the lowermost end of said hosel.

5,067,712

MULTIPLE-PULL SLOT MACHINE

Michael Georgilas, Reno, Nev., assignor to Hilton Nevada Corporation, Las Vegas, Nev.

Filed Feb. 2, 1989, Ser. No. 305,950
Int. Cl.[5] G07F 17/34
U.S. Cl. 273—143 R 9 Claims



1. An amusement apparatus having a plurality of rotating reels, arranged in a side-by-side relationship, each bearing a plurality of symbols on the peripheral surface thereof, certain combinations of which have different values which may entitle a player to a prize, and including:

means for accepting a playing disc to initiate a game by rotation of said reels;

means for analyzing and calculating the probability of obtaining certain combinations of said symbols during a first playing cycle;

means for arresting rotation of said reels at the end of said first cycle to display a first combination of symbols;

means for discriminating between a winning combination of symbols and a losing combination of symbols and a losing combination of symbols at the end of said first cycle;

means for discontinuing said first cycle and awarding a prize to said player upon the occurrence of a winning combination of symbols;

means for allowing activation of said reels for at least one other cycle at the end of each of said first cycle upon the occurrence of a losing combination of symbols;

means for automatically analyzing, calculating and altering the probability of obtaining certain combinations of symbols during said other cycle, said automatic altering being relative to said probability of obtaining certain combinations in said first playing cycle;

means for arresting rotation of said reels at the end of said

other cycle to display a different combination of symbols; and

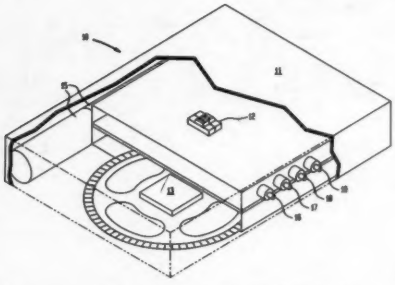
means for discontinuing said other cycle upon the occurrence of a losing combination of symbols or awarding a prize to said player upon the occurrence of a winning combination of symbols.

5,067,713

CODED PLAYING CARDS AND APPARATUS FOR DEALING A SET OF CARDS

Jack A. Soules, Shaker Heights, and Bryan D. Carpenter, Cleveland, both of Ohio, assignors to Technical Systems Corp., Cleveland, Ohio

Filed Mar. 29, 1990, Ser. No. 501,148
Int. Cl.[5] A63F *1/14*
U.S. Cl. 273—149 P **9 Claims**



1. An apparatus for manually dealing coded playing cards to each of plural locations so that a preselected set of cards will be dealt to each specific location, without contacting the sides of the cards, the apparatus comprising, a housing having a platform with a surface over which a plurality of coded cards are passed face down and read, one card at a time;

reading means for electro-optically reading each said one card as it is moved past the reading means without using a guide means to orient the card;

means for storing the number of predetermined "hands" or sets which are to be dealt as chosen;

code-processing means for processing the code read from each card in a predetermined manner to execute a program which identifies each location to which each card is to be dealt; and,

indicating means to indicate the location to which said each card read, is to be dealt.

5,067,714

VARIABLE ARRANGEMENT FLORAL DESIGN JIGSAW PUZZLE

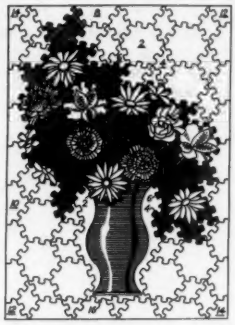
Leslie Rasberry, 209 Croft St., Greenville, S.C. 29609

Continuation-in-part of Ser. No. 370,816, Jun. 23, 1989, abandoned. This application Nov. 1, 1990, Ser. No. 609,802
Int. Cl.[5] A63F *9/10*
U.S. Cl. 273—157 R **16 Claims**

1. A jigsaw puzzle capable of being assembled into a plurlaity of arrangements, comprising:

a plurality of differently shaped and sized inner pieces and a plurality of differently shaped outer pieces; and

each of said inner pieces having a plurality of sides each configured to have protrusions and recesses therealong, said configurations being such that each of said side of any



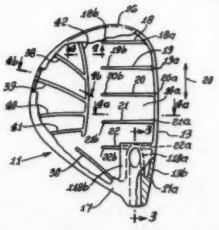
inner piece is fittingly engageable with each side of every other inner piece.

5,067,715

HOLLOW, METALLIC GOLF CLUB HEAD WITH DENDRITIC STRUCTURE

Glenn H. Schmidt, Malibu; John P. Sheehan, Covina, and Richard C. Helmstetter, Carlsbad, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Filed Oct. 16, 1990, Ser. No. 595,963
Int. Cl.[5] A63B *53/08*
U.S. Cl. 273—167 F **23 Claims**



1. In a metal wood golf club head having an elongated, forwardly facing front wall to strike a golf ball, and a hollow body rearwardly of the face plate that includes a curved rear wall, the front wall elongated in a first transverse direction toward a connection to a club shaft, the body having a thin, metallic top wall merging with upper transverse extent of the front wall, the combination comprising:

a) a first group of narrow, metallic, shock wave distributing dendrites extending from said front wall generally rearwardly adjacent the underside of the body top wall and integral therewith,

b) the dendrites spaced apart in said transverse direction, by amounts greater than their widths, the maximum height dimensions of the dendrites below the underside of the top wall being between 0.050 inches and 0.100 inches and the dendrites being generally downwardly convex in cross-section,

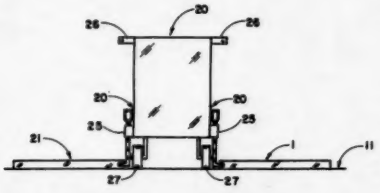
c) there being a second group of dendrites integral with said top wall and which are spaced apart in said transverse direction, and which extend generally rearwardly to merge rearwardly and downwardly with said curved rear wall to transfer rearward loading to that wall as the dendrites pick up rearward loading from said top wall in response to front wall impact with a golf ball.

5,067,716

PORTABLE MINIATURE GOLF SYSTEM AND METHOD OF USE

Kerry T. Namanny, and Keith E. Namanny, both of 183 N. Main, Cumberland, Iowa 50843

Filed Jul. 20, 1990, Ser. No. 556,356
Int. Cl.[5] A63B *67/02*
U.S. Cl. 273—176 R 4 Claims



1. A combination system comprising a transport means with one or more miniature golf greens attached thereto by attachment means;

each of which miniature golf greens has a long and a short dimension and a playing and a lower surface;

each of which miniature golf greens is comprised of said playing and lower surfaces, as well as sides, shot barriers, a hole and mounting means, which sides and shot barriers project vertically above the level of the playing surface of a miniature golf green when it is viewed in side elevation from a distance perpendicularly removed from a side thereof when the lower surface of the miniature golf green is setting upon a level horizontal surface;

which sides essentially encompass the playing surface, and which shot barriers are placed at locations on the playing surface;

which hole is in the playing surface and projects downward from the playing surface when the miniature golf green is viewed in side elevation from a distance perpendicularly removed from a side, when the miniature golf green is oriented as described above;

which mounting means are located on the miniature golf green so as to allow attachment of the miniature golf green to the transport means by way of attachment means, which attachment means attach to said mounting means;

each of which miniature golf greens allows a player thereon to cause a golf ball to be rolled upon the playing surface thereof, within the confines of the sides, around short barriers and into the hole thereof when the lower surface of the miniature golf green is resting on a level horizontal surface;

which attachment means comprises:

a. a mounting bracket which has a hole vertically therethrough as the mounting means bracket is viewed in frontal elevation at a distance perpendicularly removed therefrom, which mounting bracket is permenantly affixed to the vertical surface of a side, the front and/or back of the transport means when said transport means is positioned on a level horizontal surface;

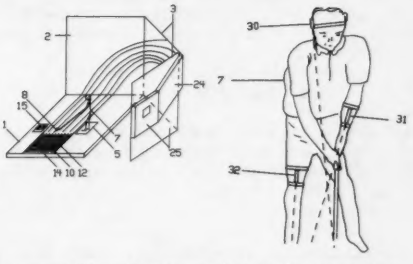
b. a sliding element which freely but securly slides vertically through the vertically oriented hole through the mounting bracket, which sliding element has a handle affixed to its upper aspect above the location of the mounting bracket, and which sliding element has a multiplicity of holes extending therethrough along its vertically oriented length, from one side to the other, as the sliding element is viewed in frontal elevation from a distance perpendicularly removed therefrom, and which sliding element has affixed thereto at its lower aspect below the location of the mounting bracket, a miniature golf green contacting bracket such that said miniature golf green contacting bracket is oriented so as to be simultaneously parallel to both the transport means to which the mounting bracket is attached at the point of its contact thereto and to the level horizontal surface surrounding the transport means, which miniature golf green contacting bracket also has projections therefrom which are oriented simultaneously both perpendicular to the transport means at the point the mounting bracket is attached thereto and parallel to the level horizontal surface surrounding the transport means, which projections from the miniature golf green contacting bracket have thereon means for attaching a miniature golf green, by way of the mountir.g means thereon, to said miniature golf green contacting bracket in a manner which allows the attached miniature golf green to be rotated between a parallel and a perpendicular orientation with respect to a level horizontal surface surrounding the transport means, and which sliding element can be caused to be raised and lowered as a result of force applied to the handle affixed to the upper aspect of the sliding element, and secured in a raised or lowered position by placing a pin or equivalent into one of the multiplicity of holes which extend from one side of the sliding element to the other side thereof, above the level of the upper aspect of the mounting bracket, so that the ends of the pin, or equivalent, project from the sides of the sliding element and rest on the upper surface of the mounting bracket, thereby, by functional interaction with the sliding element, retaining the sliding element in the intended position.

5,067,717

GOLFER'S SWING ANALYSIS DEVICE

Thomas A. Harlan, No. 16 Hightrail Way, Austin, Tex. 78738, and Joseph F. Long, 1335 Lost Creek Blvd., Austin, Tex. 78746

Filed Nov. 7, 1990, Ser. No. 611,683
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 B 4 Claims



1. A repeatable golf swing teaching device comprising:

a) a base platform, a vertical side panel and vertical back panel;

b) a pressure sensitive pad containing multiple pressure sensors on said base platform;

c) multiple sensor means and multiple green and multiple red display lights in a range of swing paths in said base platform, said vertical panel and said back panel;

d) a computer communicating with said multiple sensor means and said multiple display lights in said base platform, said vertical side panel and said vertical back panel;

e) a first form fitting battery powered light gun that may be snugly fitted to a golf student's head in a reproducible manner;

f) a second form fitting battery powered light gun that may be fitted on said golf student's left forearm in a reproducible manner;

g) a third form fitting light gun that may be reproducibly fitted around said golf students right upper leg;

h) a computer that communicates with said multiple sensor means, and said multiple pressure sensors and said multiple display lights and acts to:

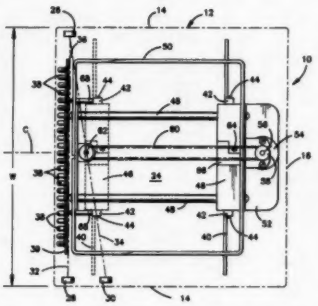
1) light a red light in said pressure sensitive pad if signals received from said multiple pressure sensors differ from a previously chosen pattern;

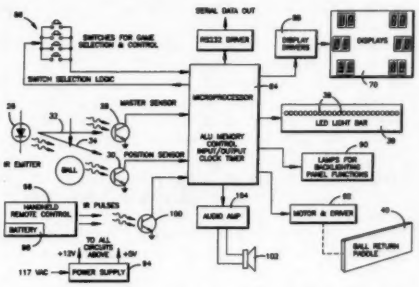
2) light a portion of said multiple red display lights indicating light path of incident light from said first form fitting powered light gun, said second light gun and said third light gun as said golf student swings at a ball;

3) record swing path of each swing and to activate an alarm if said swing path differs markedly from a prechosen swing path;

4) activate a portion of said multiple green display lights to form said pre-chosen swing paths when a save and permanent display command is entered.

detecting the time interval between the interception of the first and second beams by the ball; and





using said time interval and the ball speed to calculate the position of the ball transversely on the path when the ball rolls through the beams.

5,067,718

ROLLING BALL SPEED AND POSITION INDICATING DEVICE AND METHOD

J. Paul Knox; Robert B. Murray, III, both of Springfield, and Clinton L. Smith, Ozark, all of Mo., assignors to Golf Vegas International, Inc., Ozark, Mo.

Filed Jan. 2, 1991, Ser. No. 636,893
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—185 R **17 Claims**

1. A method of determining the speed and position of a ball rolling along a path, said method comprising the steps of:

directing a first beam substantially transversely across the path;

directing a second beam across the path at an acute angle relative to said first beam;

detecting the length of time the ball intercepts one of said beams;

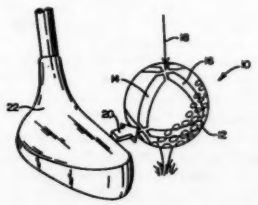
using said length of time and the ball size to calculate the speed of the ball;

5,067,719

SPIN COMMUNICATING BALL

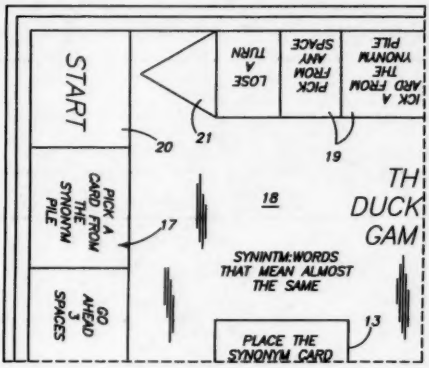
William H. Mook, 9124 Leith Dr., Dublin, Ohio 43017

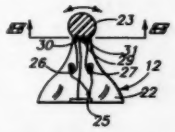
Filed Jul. 31, 1990, Ser. No. 560,804
Int. Cl.[5] A63B *41/00, 43/00, 37/14*
U.S. Cl. 273—213 **6 Claims**



1. A spin communicating ball comprising a ball having on the surface thereof color markings comprising three stripes forming three great circles on said ball with each said stripe being at right angles to the other two stripes and each said stripe being of a different primary color, said different primary colors mixing in various proportions to form a range of colors depending on the direction of spin of said ball.

5,067,720
BOARD GAME APPARATUS
Wanda F. Bundy, 45 Susie Wilson Rd., Essex Jct., Vt. 05452
Filed Mar. 4, 1991, Ser. No. 663,686
Int. Cl.[5] A63F 3/00, 9/18
U.S. Cl. 273—237 2 Claims





1. A board game apparatus comprising, in combination,

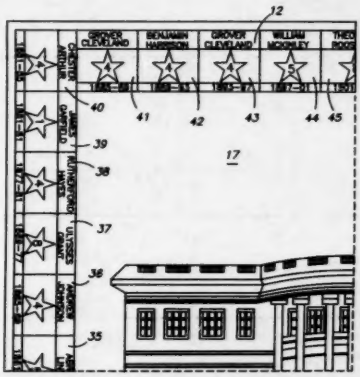
a game board, the game board including a top planar surface, the top planar surface including a discontinuous single path, the path defined by a series of directional spaces, and the game board including a central space positioned medially of the perimeter path, the central space including a respective first, second, and third space to receive a respective first, second, and third space to receive first, second, and third deck, each deck having cards posing predetermined questions for response by individual players, and

the directional spaces directing players to select a card from a respective deck from each of the respective first, second, or third deck space, and

a perimeter path including a start space and a finish space, and at least one dice member for directing movement about the perimeter path, and

at least one token means for each player for indicating position of each respective player about the perimeter path, and for indicating correctness of a response relative to questions posed by the cards of the respective decks positioned within each respective first, second, and third space, wherein each token includes a transparent base, and an opaque head, the opaque head rotatably mounted relative to the transparent base, the opaque head including an axle coaxially aligned with an axis defined by the opaque head and transparent base, and a battery mounted within the transparent base, and a first indicator light defined by a first coloration positioned within the transparent base, and a second indicator light defined by a second contrasting coloration relative to the first coloration positioned within the transparent base, and contact means for selectively effecting electrical communication between the battery and said first indicator light or said second indicator light selectively.

5,067,721
METHOD AND APPARATUS FOR PLAYING A PRESIDENTIAL BOARD GAME
Robert W. Hart, 105 S.W. 2nd St., Apt. 103, Corvallis, Oreg. 97333
Filed Jul. 9, 1990, Ser. No. 550,061
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—243 3 Claims



1. A method of a plurality of players playing a Presidential board game, wherein the method comprises the steps of,

providing a planar game board, including the step of providing a perimeter path of a predetermined number of spaces about a perimeter of an upper surface of the game board, with a central open space defined within the perimeter path, and

providing a single six-sided die, and

providing a score pad, and

providing a stack of playing cards, wherein the step of providing the playing cards includes forming a predetermined number of cards from said stack of said playing cards to correspond with each space of said predetermined number of spaces, and each card of said predetermined number of cards including at least one question associated with at least one space of said predetermined number of spaces, and

including the step of each player sequentially and initially directing the die onto the open surface of the game board to determine a starting player, and each player sequentially in turn directing the die onto the open surface to direct a player's playing piece onto one of said spaces corresponding to a predetermined die number indicated by said die, and

removing a card from said stack of playing cards and answering the at least one question associated with said card and said one of said spaces, and

wherein the predetermined number of spaces is formed as forty spaces to correspond with each of forty Presidents of the United States, and wherein the predetermined number of spaces are sequentially arranged from one through forty to correspond with the first through forty Presidents of the United States directly, and forming each of said spaces with an indication of each President and positioning a predetermined number medially of each of said spaces, wherein each predetermined number corresponds to a term of years each of said Presidents has occupied as a term of President in the United States, and

wherein a correct response to the question awards each player the predetermined number indicated upon each of said spaces of said perimeter path of the game board.

5,067,722

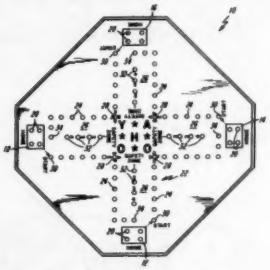
METHOD OF PLAYING A BOARD GAME

Francis P. Wesner, 151 Buck Ave., Johnstown, Pa. 15902

Continuation of Ser. No. 469,695, Jan. 24, 1990, abandoned, which is a continuation of Ser. No. 300,700, Jan. 19, 1989, abandoned, which is a continuation of Ser. No. 143,250, Dec. 29, 1987, abandoned, which is a continuation of Ser. No. 865,983, May 21, 1986, abandoned. This application Jul. 27, 1990, Ser. No. 560,455

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—248 2 Claims



1. A method of playing a board game playable by up to four players comprising the steps of:

providing four sets of movable markers, each set having a plurality of commonly colored markers, said sets being distinguishable from each other wherein the markers of one set being or a different color than the markers of the other sets, providing four individual die members, and providing a board having inscribed on the playing surface thereof a segmented pathway in the outline of a cruciform having arms of equal length radiating from a common center, each arm having a longitudinal axis with a plurality of end positions mutually spaced therealong one position for each marker in a set, said pathway formed by seven positions lying along axes on the right and left sides of the longitudinal axis, parallel to and equidistantly spaced from said axis with the seventh position being common to the next adjacent arm, each arm terminating in two positions contained in a plane normal to the longitudinal axis of the arm with one position on said axis and the other in alignment with the end position on the left hand outline or pathway axis, the four common seventh positions being designated safe and the distal end position on the right side of each arm being designated, start; four rectangular home positions, one located at the end of each arm and centered on the longitudinal axis thereof, each home position being the color of a different marker set and containing a plurality of marker home positions,

assigning each player set of markers and a die;

dividing the players into two teams wherein each player has a partner;

placing said markers on their respectively colored home positions;

each player rolling their die in turn, when a player rolls a predetermined number on said die said player moving one of his assigned markers to said respective start position;

each player, in turn, continuing the rolling of their dice and alternatively advancing along the pathway only their said assigned markers, which were previously placed on said start position, or moving only one of their said assigned markers from said respective home position to said respective start position according to the die roll;

said advancing markers only one circuit around said pathway and then moving said markers toward their respective end positions;

when a first player has successfully advanced his assigned set of markers into his respective end positions before his partner does, said first player maintaining his turn and assisting his partner by using his turn to roll his die and advance his partner's markers, the team advancing both their sets of markers into their respective end positions first, being the winner.

5,067,723

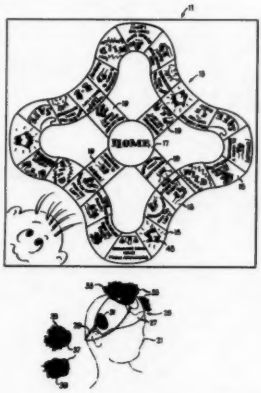
HEAD MASK TABLETOP ACTION GAME

Paula M. Yurkovic, Chicago, Ill., assignor to Irwin Toy Ltd., Toronto, Canada

Filed Feb. 8, 1991, Ser. No. 653,038

Int. Cl.[5] A63F *3/00*; A63H *33/00*

U.S. Cl. 273—249 2 Claims



1. A tabletop action game for three or more players, including:

a head mask to be worn by each player,

each head mask having easily releasable fastening means for attaching locks of hair to the helmet,

a plurality of locks of hair being attached to each head mask, with each lock being of a different specified color of a selected limited set of colors,

a playing board having a path indicated thereon,

said path having a series of spaces starting at a beginning and continuing to an end,

a distinctive marker for each player which marker will fit on a space of the series of spaces forming said path,

means to randomly indicate, within a range, the number of spaces a player must move his marker during his playing turn, and

indicia on at least some of said squares in said path to indicate the player whose marker lands on one of said squares is entitled to remove a lock of hair from the head mask of another player and attach it by means of the easily releasable fastening means to his own head mask.

5,067,724

METHOD OF PLAYING A POKER GAME

Raymond M. Rinkavage, 3E Queen Tr., Southington, Conn. 06489

Filed Dec. 5, 1990, Ser. No. 622,624

Int. Cl.[5] A63F *1/00*

U.S. Cl. 273—292 4 Claims

1. A method of playing a poker game, including a plurality of players, comprising the steps of,

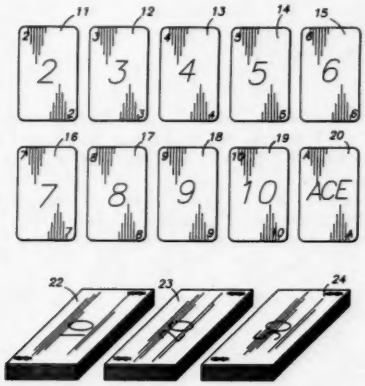
providing a deck of cards, including a plurality of identical sets of a predetermined number of cards, each card in each identical set having a distinguishable numerical value and each identical set of cards representing numerals in ascending order and

providing each player with a predetermined amount of currency, and

selecting a dealer from a plurality of players, and

the dealer distributing a finite number of cards to each of the plurality of players, wherein the finite number of cards is less than ten percent of the number of cards in the deck of cards, and

each player in turn announces a bid of a predetermined number of like numbered cards based on a first number of the like number of cards held by each player and a second number of the like number of cards based on speculation



to be held by remaining players of the plurality of players, and

opposing players selectively challenging the bid or selectively presenting a further bid defining a further number of cards greater than the group of like numbered cards, wherein said each player by correctly substantiating the bid subject to the challenge receives from each player a penalty number of currency or alternatively, upon not substantiating the bid, pays each remaining player of the plurality of players the predetermined number of currency dollars.

5,067,725

NUMBER-SENSE CARD GAME

Leonora M. Leach, 113-15 34th Ave., Corona, N.Y. 11368

Filed Dec. 3, 1990, Ser. No. 621,090

Int. Cl.[5] A63F *1/00*; G09B *19/02, 19/22*

U.S. Cl. 273—302 **1 Claim**

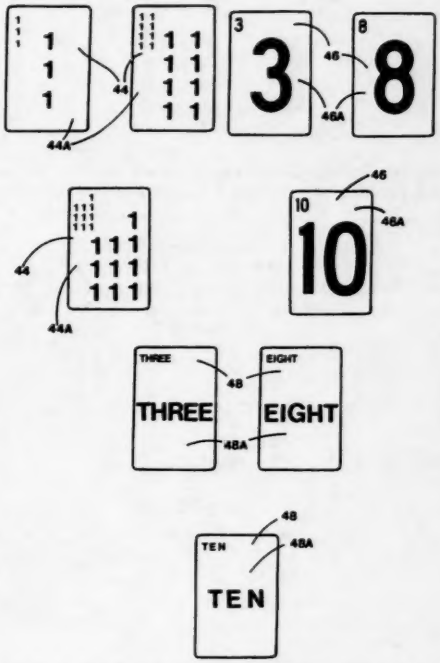
1. A number-sense card game for representing the numbers from one to ten in three different ways comprising in combination:

a first deck of cards representing numbers in a first way wherein each card of said first deck having a number of "1" digits printed thereon corresponding to a number from one to ten, wherein a card having a single "1" digit represents the number one, and a card having ten "1" digits represents the number ten, a small replica of which is printed on one of the upper corners of said cards;

a second deck of cards representing numbers in a second way wherein each card of said second deck having a single numerical character representing a number from one to ten, a small replica of which is printed on one of the upper corners of said cards;

a third deck of cards representing numbers in a third way wherein each card of said third deck having a word naming a number from one to ten, a small replica of which is on one of the upper corners of said cards;

a fourth deck of cards representing numbers in all said three ways wherein a first set of cards in said fourth deck having a number of "1" digits printed thereon, a second set of cards in said fourth deck having a single numerical charater printed thereon, and a third set of cards in said fourth



deck having a word naming a number from one to ten, wherein all three sets of cards represent the numbers from one th ten.

5,067,726

LACROSSE STICK HEAD WITH A THROAT WALL RIB AND BALL STOP MEMBER

William H. Brine, III, Mendon, Mass., and Peter J. Brine, Hanover, N.H., assignors to Sports Licensing, Inc., Hanover, N.H.

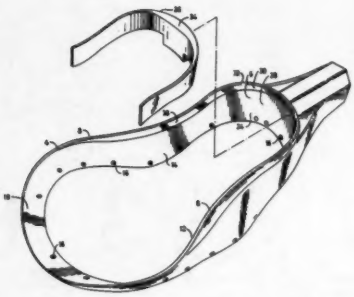
Filed Dec. 14, 1990, Ser. No. 628,419

Int. Cl.[5] A63B *59/02*

U.S. Cl. 273—326 **8 Claims**

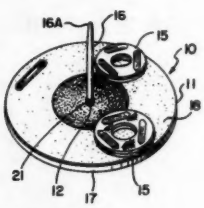
1. A lacrosse stick head comprising a frame and netting attached to said frame, said frame comprising a throat wall, side wall means extending from said throat wall, and a lip portion joined to an end of said side wall means remote from

said throat wall, said netting being configured to define a ball pocket, rib means on said throat wall extending inwardly



therefrom, and a ball stop member secured to said throat wall with an edge of said ball stop member adjacent said rib means.

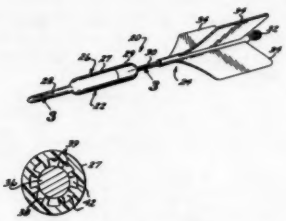
5,067,727
RING TOSS GAME
Perry D. Crompton, 15543 Sprig St., Chino Hills, Calif. 91709
Filed May 7, 1991, Ser. No. 697,029
Int. Cl.[5] A63B *67/06*
U.S. Cl. 273—336 **22 Claims**



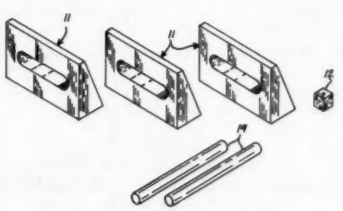
1. A game of skill comprising;
a. a first target board having on a surface thereof a fabric covering with a loose pile,
b. a second target board substantially identical to said first game board, and
c. at least one throwing object for tossing from a distance onto either of said first and second target boards, said throwing object having on two opposite sides thereof fabric having a plurality of hooks protruding therefrom of the proper size and shape to adhere to said loose pile of said target board, whereby said throwing object will adhere to said target board when thrown onto said target board, and whereby said first and second target boards may be adhered to opposite sides of said throwing object, thereby forming a self-contained package sandwiching said throwing object between said first and second target boards.

5,067,728
LAWN DART WITH SAFETY FEATURE
Bemanali H. Dadbeh, Seal Beach, Calif., assignor to Harvard Sports, Inc., Compton, Calif.
Continuation of Ser. No. 148,042, Jan. 25, 1988, abandoned. This application Aug. 29, 1988, Ser. No. 237,538
Int. Cl.[5] A63B *65/02*
U.S. Cl. 273—420 **4 Claims**

1. A lawn dart comprising:
a first member having a flexible tip portion and a hollow portion; said hollow portion having a longitudinally extending axis;
a weight member fixedly positioned within said hollow portions;
a plurality of radially extending members formed on the inner surface of said hollow portion, the far ends thereof contacting said weight member within said hollow portion to form a plurality of air passages, the flexible tip and air passages acting to absorb and dissipate the energy of impact; and
an elongated member coupled at one end to said first flexible member and having a plurality of fins extending radially from the other end.



5,067,729
BLOCK STACKING GAME APPARATUS
Gary W. Hunter, 1603 Landing Ct., Woodstock, Ga. 30188, and Robert L. Leeper, 2327 Dayron Cir., Marietta, Ga. 30062
Filed Oct. 15, 1990, Ser. No. 597,515
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—450 **2 Claims**



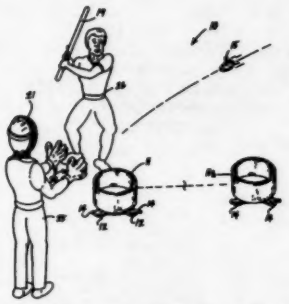
1. A block stacking game apparatus for stacking of blocks in a balanced relationship relative to one another to define a tower, wherein the apparatus comprises,
a plurality of block members, the block members each defined by an equal predetermined length and each defined by a respective identical trapezoidal prism and shape, and
a die member to sequentially direct players in stacking of the block members, and
wherein each block member includes a first side wall, a second side wall, a third side all, and a fourth wall, the second and fourth side walls arranged parallel relative to one another, and the first side wall defined by a first length, the second side wall defined by a second length, the third side wall defined by a third length, and the fourth side wall defined by a fourth length, wherein the third length is greater than the first length, the first length is greater than the second length, and the second length is greater than the fourth length, and
including an elongate enclosed slot directed through the first and third side walls, the enclosed slot of each block member positioned medially and arranged parallel between the second and fourth side walls.

5,067,730

SPORTS GAME ORGANIZATION

Charles Wanalista, 749 Main St., Avoca, Pa. 18641

Filed Mar. 12, 1991, Ser. No. 668,043
Int. Cl.[5] A63B 67/00, 65/00
U.S. Cl. 273—411 3 Claims



1. A method of playing a sports game comprising the steps of,

providing a first container and a second container, each container including a plurality of leg members, and each leg member of the plurality of leg members including a through-extending aperture therethrough, and

a plurality of securement pins, and

a securement pin of the plurality of securement pins directed through each aperture of each of the support legs, and

securing the first container and the second container at a predetermined spacing relative to one another, and

providing a tubular projectile, with the tubular projectile formed with a flexible covering skin and an interior granular material to effect gyratory flight of the projectile when impacted, and

a plurality of bat members, and

a plurality of teams, and each team formed with a plurality of players, and

providing each of the teams with a bat member, and designating a first team with a first player the first team positioned behind the second container member, and

the second player of the first team positioned adjacent the first container, and

providing the second player with the bat member, and

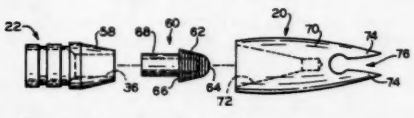
positioning the first player of the second team behind the first container member adjacent the second player of the first team.

5,067,731

NOCK ADAPTER

Wayne J. Bickel, Rte. 1, Box 241, Geneva, Ind. 46740

Filed May 25, 1990, Ser. No. 529,233
Int. Cl.[5] F42B 6/06
U.S. Cl. 273—416 4 Claims



1. An arrow assembly comprising:

a shaft;

a nock including an internal mounting surface;

a nock adapter for securing said nock to said shaft, said adapter having a body with a central through aperture therein, a first end of said nock adapter engaging one end of said shaft, and a second end of said nock adapter engaging said nock, said second end including a external tapered mounting surface engaging said nock internal mounting surface; and

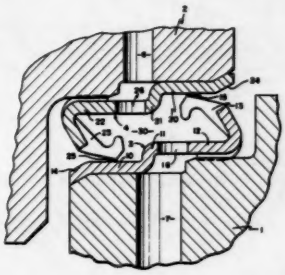
an adapter extension attached to said second end and including an external tapered mounting surface, said nock internal mounting surface engaging both said external mounting surface of said nock adapter and of said adapter extension.

5,067,732

SEAL ASSEMBLY

Steve B. Szabo, Washington; Daniel G. Chien, Royal Oak; and Bruce V. Cobb, Livonia, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1990, Ser. No. 509,125
Int. Cl.[5] F16J 15/32, 15/46; F16C 33/78
U.S. Cl. 277—11 10 Claims



1. A seal assembly comprising first and second annular seal elements each having a generally axially extending base and an annular radial lip, each of said bases including a wear surface portion, a central portion and an end portion, each of said annular radial lips extending, from a respective base end portion, generally away from said base in a radial direction and generally inward toward said central portion in an axial direction, each of said central portions including at least one bore therethrough, said first and second seal elements being arranged such that the wear surface portion of each seal element provides a wearing surface for the radial lip portion of the other seal element whereby when assembled, the seal assembly forms a fluid tight annular cavity except for the bores between the seal elements and the bores permit the passage of a fluid medium into and out of the annular cavity.

5,067,733

MECHANICAL SEAL INCLUDING A SPLIT SEAL RING

Yataro Nagai; Mitsuyoshi Matsushita, and Yuji Yamauchi, all of Tokyo, Japan, assignors to Tanken Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 216,155, Jul. 7, 1988, abandoned. This application May 18, 1990, Ser. No. 527,658
Claims priority, application Japan, Jul. 31, 1987, 62/116638; Jul. 31, 1987, 62/116639
Int. Cl.[5] B21D 39/04; B23P 19/04; B23Q 3/00; F16J 15/38
U.S. Cl. 277—11 6 Claims

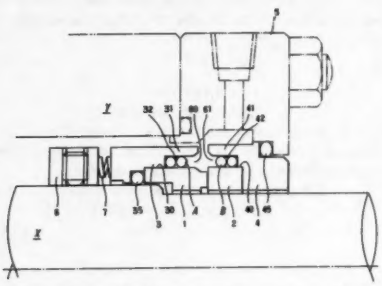
1. A mechanical seal having two seal rings which forms a rotatably sliding sealing face comprising:

a first seal ring which is split in at least two circular-arc-segments,

a support ring which receives said first ring and covers over an outer face of said first seal ring with a predetermined gap which has an opening to receive a removable tool to force at least two O rings into abuttingly adjacent relationship therein so as to secure said first ring to said support ring even after said tool is removed,

said O rings being abuttingly adjacent each other and inserted into the gap between said first seal ring and the

support ring which fastens said first seal ring so as to form a circle, the cross-sectional diameter of each said O ring being enough larger than the size of the gap so that each said O ring fastens and integrates said two segments into a



circular shape, whereby substantial sliding of said first seal ring with respect to said support ring is prevented and whereby said O rings firmly seal said gap, and

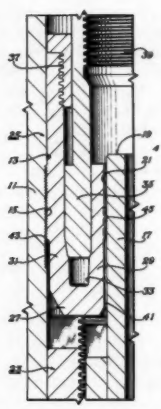
a second seal ring.

5,067,734

METAL SEAL WITH GROOVED INLAYS

Carl F. Boehm, Jr., Houston, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.

Filed Jun. 1, 1990, Ser. No. 531,886
Int. Cl.[5] F16J *15/08*
U.S. Cl. 277—236 **3 Claims**



1. In an apparatus having a cylindrical member, an improved means for sealing against the cylindrical member, comprising in combination:

a metal ring having a sealing side facing the cylindrical member;

means for moving the sealing side into sealing contact with the cylindrical member;

a plurality of circumferential axially spaced metal bands protruding radially from the sealing side, defining cavities between the bands, the bands being sufficiently softer than the cylindrical member to deform when forced into contact with the cylindrical member;

an inlay material of metal softer than the bands located in the cavities, the inlay material having a sealing side which is forced into contact with the cylindrical member; and

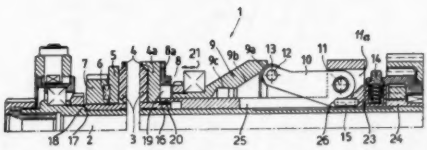
an annular groove formed in the sealing side of the inlay material, the bands causing the material of the inlay to flow toward the groove as the inlay is forced into contact with the cylindrical member, the movement of the material of the inlay as it is forced into contact with the cylindrical member causing a shearing action on the surface of the inlay to enhance sealing.

5,067,735

CLAMPING DEVICE FOR LOCKING THE WORKPIECE-CARRYING COLLET IN AUTOMATIC MACHINE TOOLS

Enrico Ronzoni, Bergamo, Italy, assignor to Gildemeister Italiana S.p.A., Brembate Sopra, Italy

Filed Jul. 23, 1990, Ser. No. 557,088
Claims priority, application Italy, Oct. 20, 1989, 22079 A/89
Int. Cl.[5] B23B *31/20*
U.S. Cl. 279—1 F **4 Claims**



1. In a clamping device for locking a workpiece-carrying collet in an automatic machine tool, the clamping device having a movable traction device (**21**) and linkage means (**1**) moving a traction rod (**2**) with the movement of the traction device for collet closing, clamping and opening operations, the improved linkage means (**1**) comprising:

a plastic prestressing string (**3**) having a relatively flat elasticity characteristic, the spring consisting of a sleeved-shaped component;

a dish-like component (**4**) having a bottom (**4***a*) that receives one end othe the spring (**3**);

a disc (**5**) abutting an opposite end of the spring (**3**);

a pressure sleeve (**16**) that extends through the spring (**3**), dish-like component (**4**) and disc (**5**) and about a traction rod (**2**), one end (**17**) of the pressure sleeve (**16**) engaging a stop (**18**) on the traction rod (**2**) for moving it;

an adjusting nut (**7**) on the one end of the pressure sleeve (**16**) and engaging the disc (**5**);

an indicator nut (**8**) on an opposite end of the pressure sleeve (**16**) and cooperative with the bottom (**4***a*) of the dish-like component (**4**);

an annular support (**11***a*) about the traction rod (**2**);

a profiled abutment and positioning sleeve (**9**) about the annular support (**11***a*), the sleeve (**9**) having successive segments (**9***a*, **9***b*, **9***c*) in the axial direction and engaging a traction device (**21**) for movement thereby; and

a plurality of closing levers (**10**) spaced circumferentially about the annular support (**11***a*), each closing lever being hinged at one end (**11**) on the annular support (**11***a*), the segments of the sleeve (**9**) forming an abutment for the opposite ends of the closing levers (**10**) in dependence on the position of a clamping collet and the actual diameter of a workpiece to be clamped thereby,

the annular support (**11***a*) cooperating at one end with the bottom (**4***a*) of the dish-like component (**4**) and at its opposite end with a ring (**23**) fixed on a spindle (**24**) via rollers (**15**) which eccentrically engage the closing levers (**10**).

5,067,736

SLOTTED BRAKE FOR IN-LINE ROLLER SKATE

Brennan J. Olson, and Thomas J. Brace, both of Minneapolis, Minn., assignors to Rollerblade, Inc.

Filed Aug. 22, 1989, Ser. No. 396,968
Int. Cl.[5] A63C *17/14*
U.S. Cl. 280—11.2 **5 Claims**

1. A roller skate and brake usable on a road surface by an operator to achieve improved braking efficiency comprising:

an in-line roller skate frame carrying a plurality of wheels mounted for rotation about a plurality of parallel axles, said axles including at least front and rear axles to permit rolling movement of said frame in forward and rearward directions;

means for attaching said skate frame to the operator;

a brake housing member formed of substantially rigid material and including:

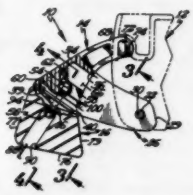
means attaching said housing member to said skate frame;

a pair of lateral side walls and a rear wall extending between said side walls; and

a rigid plate extending between said side walls and said rear wall and positioned to overlie the road surface;

an integral brake pad member formed of resilient material having a high coefficient of friction carried by said housing member and including first and second lateral side faces, a front face, a rear face, an upper face and a base, said base confronting the road surface so as to frictionally engage the road surface when said skate frame is pivoted about said rear axle to bring said base into contact with the road surface;

slot means on one of said members and tongue means on the other of said members with said tongue means being mateably received within said slot means to cause said pad member to be retained to said housing member with said



upper face of said pad member closely confronting said plate;

said slot and tongue means being constructed and arranged such that during braking operation said members are urged into locking engagement with one another as a result of frictional forces generated between said pad member and the road surface, said forces urging said pad member rearwardly against said housing member to drive said tongue means into said slot means so as to increase the locking engagement between said members during braking;

said pad member including a generally upright aperture extending between said upper face and said base;

said housing member including an aperture in said plate positioned to communicate with said pad member aperture when said tongue means and slot means are mateably engaged;

fastening means extending through said communicating apertures to retain said tongue means in said slot means;

said fastening means being a screw and a nut, said screw including a shaft for receiving said nut; and

wherein said plate aperture is an open ended, forwardly extending groove for slidably receiving and guiding said screw shaft when said screw shaft extends from said pad member aperture and while said tongue means slides into mating engagement with said slot means.

5,067,737

WHEELBARROW HAVING A PAIR OF AUXILIARY DUMPING RODS

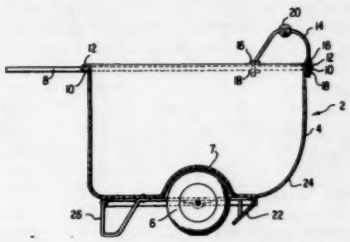
Bryon C. Broeske, R.R. No. 1, Box 159, Dorchester, Wis. 54425

Filed Dec. 28, 1990, Ser. No. 635,700

Int. Cl.[5] B62B *1/22*

U.S. Cl. 280—47.31 **17 Claims**

1. A wheelbarrow comprising a load box, a supporting wheel rotatably engaged with said load box at least one handle engaged with a rearward end of said load box for guiding the wheelbarrow, wherein said wheelbarrow further comprises a pair of dumping rods each extending in a curve upward between and engaged with two spaced apart positions on an



upper edge of a forward end of said load box wherein said dumping rods are in a ground engaging position on dumping of a load from said load box.

5,067,738

CHILD POWERED BICYCLE TRAILER

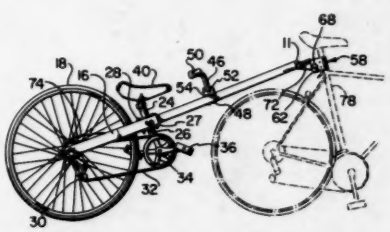
Richard J. O'Connor, 2035 Woodglen Crescent, Gloucester, Ontario, Canada K15666

Filed Oct. 22, 1990, Ser. No. 600,730

Claims priority, application Canada, Jun. 21, 1990, 2019471

Int. Cl.[5] B62K *27/00*

U.S. Cl. 280—204 **14 Claims**



1. A trailer for attachment to a bicycle having a frame, a seat for supporting a rider and a seat post coupling that seat to the frame, comprising:

(a) an elongated support member having a first and an other end;

(b) detachable attachment means for pivotally attaching the first end of the support member to a portion of the bicycle so that the support member extends rearwardly in a downwardly inclined fashion;

(c) driving means attached to the support member intermediate the first and other end;

(d) a driveable ground engaging wheel rotatably mounted to the other end; and

(e) seat means attached to the support member for supporting a rider.

5,067,739

STRUCTURE OF MOTORCYCLE STAND

Chung A. Kuan, No. 32, Village Mei Pu, Tai Pao Hsiang, Chia-I, Taiwan

Filed Dec. 21, 1990, Ser. No. 631,497

Int. Cl.[5] B62H *1/06*

U.S. Cl. 280—304 **1 Claim**

1. The motorcyle stand, comprising a substantially H-shaped tubular frame defining therein two cylindrical side chambers vertically disposed at two opposite sides with a cylindrical cross chamber transversely disposed therebetween, said cross chamber having set therein a transmission gear set to drive two driving bevel gears to respectively drive two extendible sup-

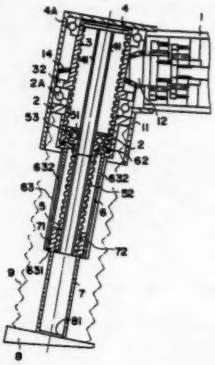
ports to respectively extend out of said two cylindrical side chambers for supporting a motorcycle in place or receive inside said two cylindrical side chambers permitting said motorcycle to be driven to move, wherein said two extendible supports are each comprised of:

a socket having an annular top flange projecting outwards at the top for mounting a ball bearing, and two opposite projecting strips respectively projecting inwards at the bottom;

a transmission tube fastened to the inner top of either one of said two cylindrical side chambers via a ball bearing, having a collar at the middle thereof and carried on the top edge of the ball bearing mounted on said annular top flange, and an inner thread on the inner wall surface thereof, said collar having a notch made thereon;

a ring-shaped bevel driven gear sleeved on said transmission tube and engaged with either one of said two driving bevel gears, having a vertical plate at the bottom thereof and fastened in said notch on said collar for driving said transmission tube to rotate;

a driven screw bolt having a butterfly boring bore through the central axis thereof, an extended head, and an elongated outer thread portion extending downward from said extended head at the center;



a T-shaped driving rod, having two unitary, columnar ribs at two opposite sides respectively engaged in said butterfly boring bore and driven by said transmission tube to carry said driven screw bolt to rotate;

a tube-shaped movable coupling having a raised outer thread portion on the smooth outer wall surface thereof at an upper end and engaged with the inner thread of said transmission tube, an annular projection projecting in the bore thereof to support the extended head of said driven screw bolt permitting said driven screw bolt to be driven by said T-shaped driving rod to rotate inside said tube-shaped movable coupling, two elongated inner grooves on the inner surface wall thereof at two opposite locations, and two elongated outer grooves on the outer wall surface thereof at two opposite locations and respectively engaged with the two opposite projecting strips of said socket;

a movable tube having two opposite projecting strips on the outer wall surface thereof at one end and respectively engaged in the two elongated inner grooves of said tube-shaped movable coupling, and an inner thread over the inner wall surface thereof and engaged with the outer thread portion of said driven screw bolt; and

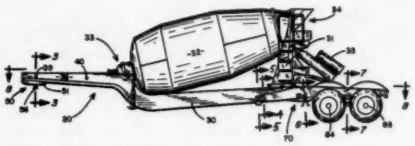
a shoe made of resilient material in circular shape, having a stub rod at the top center thereof and fastened in said movable tube at the bottom.

5,067,740

STRETCH TRAILER MIXER

Ronald E. Christenson, Kasson, Minn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Continuation of Ser. No. 441,253, Nov. 27, 1989, abandoned.
This application Dec. 14, 1990, Ser. No. 629,050
Int. Cl.[5] B60D *1/44*
U.S. Cl. 280—407 **6 Claims**



1. A trailer for a tractor trailer combination comprising:

(a) a first frame member;

(b) a hitch pin assembly;

(c) means for securing said hitch pin assembly to said first frame member so that said hitch pin assembly can be slid longitudinally with respect to said first frame between first and second pre-selected positions;

(d) means for releasably locking said hitch pin assembly to said first frame member in either said first or said second pre-selected position;

(e) a rear slider assembly having at least one axle and an associated pair of wheels which help support the trailer;

(f) means for securing said rear slider assembly to said first frame member so that said rear slider assembly can be slid longitudinally with respect to said first frame member between a retracted roading position in which the first frame member has a first height, yielding a higher center of gravity and greater ground clearance over the entire length of the trailer bed, and an extended second roading position in which the first frame member has a second height, yielding a lower center of gravity and less ground clearance than in first roading position; and

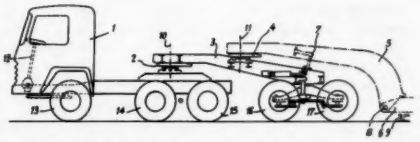
(g) means for releasably locking said rear slider assembly to said first frame means in either said third or fourth pre-selected position.

5,067,741

DEVICES USING A DOLLY FOR REINFORCING THE LOADING CAPACITY OF TRACTOR VEHICLES

Jacques Ayme, Montelimar, France, assignor to A.C.T.M., France

Filed Dec. 8, 1988, Ser. No. 281,146
Claims priority, application France, Dec. 10, 1987, 87 17212
Int. Cl.[5] B62D *12/02*
U.S. Cl. 280—419 **8 Claims**



1. A device for reinforcing a loading capacity of a tractor vehicle for receiving a transport semi-trailer for transporting heavy loads, which comprises:

(a) an intermediate short semi-trailer called a dolly having a longitudinal axis and having a front part coupled to the tractor vehicle having tractor steering wheels and having a longitudinal axis, said dolly freely pivotable about a vertical axis and coupled to the transport semi-trailer in its turn for freely pivoting about a vertical axis,

(b) dolly steering wheels secured to said dolly,

(c) detecting means associated with said tractor steering wheels for detecting an amount of steering movement of said tractor steering wheels,

(d) control means associated with the dolly steering wheels to control a steering movement thereof, and

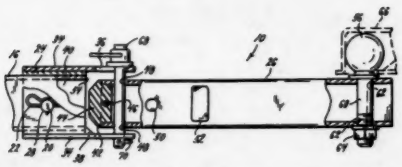
(e) means connecting said detecting means and said control means to automatically provide, for any variation of a steering position of the tractor steering wheels, a variation of a steering position of the dolly steering wheels such that the longitudinal axis of the dolly is subtantially in alignment with the longitudinal axis of the tractor vehicle in straight line travel as well as in curved travel and in forward travel as well as in rearward travel.

5,067,742

QUICK HITCH ASSEMBLY FOR COUPLING A VEHICLE AND TRAILER

Frank S. Relja, HCR 64, Box #46, French Village, Mo. 63036

Filed Aug. 9, 1990, Ser. No. 564,569
Int. Cl.[5] B60D *1/40*
U.S. Cl. 280—479.2 **11 Claims**



1. An apparatus for use in quick hitch coupling a trailer to a vehicle, where the trailer is provided with a hitch coupler and the vehicle is provided with a tow bar receiver channel having a hollow interior and a pair of holes extending laterally therethrough, the apparatus comprising:

a hitch sleeve having first and second ends, the first end being adapted to fit slidably over the receiver channel and to be releasably secured thereto, and the second end being adapted to extend rearward from the receiver channel; and

a tow bar having first and second ends, the first end being adapted to be releasably and pivotally connected to the second end of the sleeve, and being further adapted to be inserted into and slidably received in the receiver channel, and the second end being adapted to be releasably and pivotally connected to the hitch coupler of the trailer.

5,067,743

PRESSURE CONTROL SYSTEM FOR SUSPENSION

Kouichi Kokubo, Nagoya; Shinichi Tagawa; Masaki Kawanishi, both of Toyota; Kunihito Sato, Susono; Shuuichi Buma, Toyota; Takashi Yonekawa, Mishima, and Toshio Aburaya, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Kariya and Aisin Seiki Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 27, 1990, Ser. No. 572,621
Claims priority, application Japan, Aug. 28, 1989, 1-221243
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 **5 Claims**

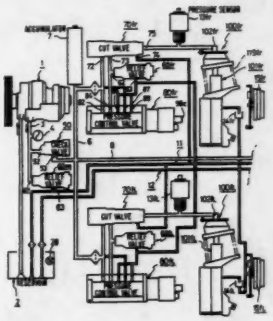
1. A pressure control system for suspension comprising:

a pressure control valve which is interposed between an actuator in a suspension mechanism and a pressure source;

a cut valve which cuts off a fluid path from the pressure control valve to the actuator when a pressure of the pressure source is below a predetermined value and communicates the fluid path when the pressure of the pressure source exceeds the predetermined value;

an acceleration detector which detects an acceleration of a vehicle body on the suspension mechanism; and

an electronic controller for initiating, before the cut valve opens the fluid path from the pressure source to the pressure control valve, an attitude control in which the controller calculate a pressure compensation value in accordance with an acceleration detected by the acceleration detector for suppressing a change of an attitude of the



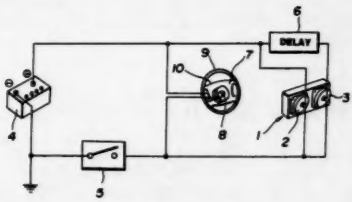
vehicle body which might be caused by the acceleration of the vehicle body and indicates an adjustment of a pressure by the calculated compensation value to the pressure control valve.

5,067,744

AIR BAG SYSTEM

Hirokazu Hirabayashi, Kanagawa, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed May 23, 1990, Ser. No. 527,474
Claims priority, application Japan, May 23, 1989, 1-129890
Int. Cl.[5] B60R *21/32*
U.S. Cl. 280—734 **2 Claims**



1. A stepped pressurized air bag system for an automotive vehicle comprising:

means for detecting and outputting a signal in response to a collision of said vehicle;

an air bag located with said automotive vehicle so as to restrain a passenger when pressurized;

a first gas generator for expanding said air bag to a first pressure level in response to said signal;

means for delaying said collision detection signal for a predetermined time interval;

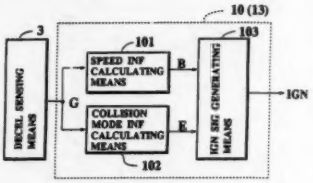
a second gas generator for further expanding said air bag to a second pressure higher than said first level, said first and second pressure levels and said time interval being so selected as to satisfy a required level of restricting the passenger's movement while keeping an impact force of said air bag against the passenger caused by its being pressurized by said first and second gas generators within a required limit.

5,067,745

AIR BAG IGNITION CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE AND THE METHOD

Hironori Yoshikawa, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 21, 1990, Ser. No. 586,081
Claims priority, application Japan, Sep. 28, 1989, 1-253461
Int. Cl.[5] B60R *21/32*
U.S. Cl. 280—735 **13 Claims**



1. An air bag ignition control system for an automotive vehicle, comprising;

(a) single deceleration sensing means for sensing vehicle deceleration due to collision and generating deceleration detection signals;

(b) speed information calculating means responsive to said deceleration sensing means, for calculating a speed information value on the basis of accumulative low-frequency components of the deceleration detection signals;

(c) collision mode information calculating means responsive to said deceleration sensing means, for calculating as collision mode information value on the basis of accumulative differences in signal level between the maximum and minimum low frequency components of the deceleration detection signals within a predetermined sampling period; and

(d) ignition signal generating means responsive to said speed information calculating means and said collision mode information calculating means, for calculating an ignition decision information value on the basis of the calculated speed information value and collision mode information value and generating an air bag ignition signal when the calculated ignition decision information value exceeds a predetermined value.

5,067,746

ANTI-THEFT TRAILER JACK AND METHOD OF USING SAME

John E. Baker, 915 S. 13th St., St. Joseph, Mo. 64503

Filed Aug. 15, 1990, Ser. No. 567,780
Int. Cl.[5] B60S *9/04*
U.S. Cl. 280—763.1 **8 Claims**

1. A theft deterrent support assembly for use in combination with a land vehicle resting upon a surface, said supporat assembly comprising;

a generally horizontal mounting plate permanently affixed to an underside of said land vehicle,

a vertically depending member transversely attached thereto and having a passage therethrough,

said mounting plate and depending member defined by two generally parallel lateral edges,

two substantially parallel backing braces extending between and adjoining each said mounting plate lateral edge and corresponding depending member lateral edge and thereby defining an included space therebetween,

said mounting plate providing for the pivotal attachment of one end of a support strut,

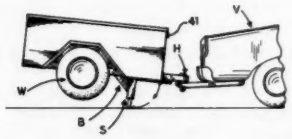
said support strut defined by one end providing said pivotal attachment and an opposite distal end,

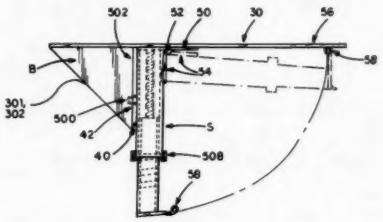
said support strut having a staple extending therefrom and cooperating with said depending member passage when said support strut is pivoted to an extended position adjacent said depending member,

said support strut distal end having a hasp attached thereto and cooperating with securing means on said mounting plate,

said distal end hasp and said mounting plate securing means providing security for said support strut when said support strut is in a stored position,

said support strut providing a length between said pivoted end and said distal end which is greater than the distance between said land vehicle underside and said surface,





said support strut pivotable from said stored postion to said extended position,

said extended position providing support for a portion of said land vehicle and capable of lifting at least one wheel of said land vehicle clear of said surface,

said support strut staple extending through said depending member passage and providing for securing by securing means when said support strut is in said extended position, whereby

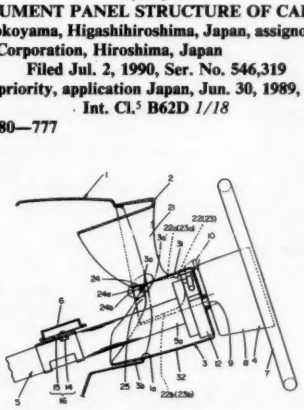
said securing means is protected from tampering and damage by said included space provided by said parallel backing braces.

5,067,747

INSTRUMENT PANEL STRUCTURE OF CAR BODY

Hideki Yokoyama, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 2, 1990, Ser. No. 546,319
Claims priority, application Japan, Jun. 30, 1989, 1-77854[U]
Int. Cl.[5] B62D *1/18*
U.S. Cl. 280—777 **10 Claims**



1. An instrument panel structure of an automotive vehicle, having a collapsible steering shaft extending towards a driver seat of the automotive vehicle and an instrument panel including an opening formed therein, said instrument panel having mounted thereon a cluster gauge and a visor bank surrounding

said cluster gauge, and being disposed in front of said driver seat, said opening formed in said instrument panel and receiving said collapsible steering shaft, said instrument panel structure comprising:

a cover having a hollow shell which is generally cylindrically shaped so as to cover an end portion of said collapsible steering shaft projecting above said instrument panel; and

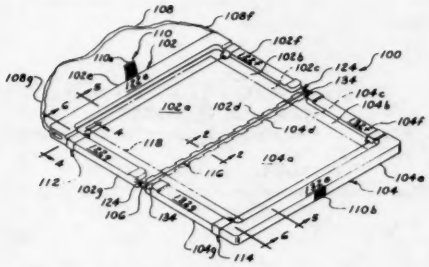
guide means provided between said visor bank and an end of said cover for guiding movement of said hollow shell during a collision, the guide means having an inwardly bent flap section forming a surface for engaging said end of said cover and sliding over said hollow shell as it sinks into said opening when said collapsible steering shaft axially collapses during said collision.

5,067,748

COMBINATION HOLDER/ENCLOSURE FOR MULTI-LEAF ARTICLES, ESPECIALLY NEWSPAPERS

Charles A. Wernquest, 99 Riverview Rd., Niantic, Conn. 06357

Filed Nov. 8, 1990, Ser. No. 610,811
Int. Cl.[5] B92D *3/00*
U.S. Cl. 281—48 **9 Claims**



1. Combination holder/enclosure for a multi-leaf folded article comprising:

a rigid, generally planar, generally rectangular front cover having a planar inside surface, an inner edge, an outer edge opposite the inner edge, a top edge, a bottom edge opposite the top edge, an inside surface and an outside surface;

a rigid, generally planar, generally rectangular back cover having a planar inside surface, an inner edge, an outer edge opposite the inner edge, a top edge, a bottom edge opposite the top edge, an inside surface and an outside surface;

a rigid elongated spline member forming a hinge with the inner edges of the front and back covers and having an inside surface contiguous with the inside surfaces of the front and back covers;

first leaf retaining means for retaining a portion of leaves on one side of an open multi-leaf article flat against the inside surface of the front cover;

second leaf retaining means for retaining the remaining leaves on another side of the open multi-leaf article flat against the inside surface of the back cover; and

third leaf retaining means for retaining the fold of the multi-leaf article against the inside surface of the spline member.

5,067,749

METHOD AND APPARATUS FOR OBTAINING AND RECORDING FINGERPRINT INDICIA

Larry D. Land, 1946 Edgerton, St. Paul, Minn. 55117

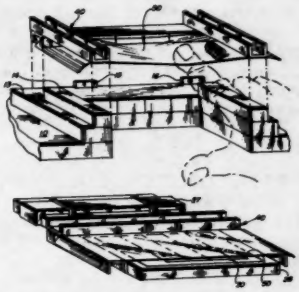
Filed Jan. 9, 1989, Ser. No. 294,219
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—117 **14 Claims**

1. Fingerprinting apparatus comprising:

(a) dispensing means for dispensing a transparent, flexible film media having at least one surface containing a layer of adhesive;

(b) coating means containing an opaque material for coating the distal digits of a plurality of fingers of a subject brought into contact with the material and wherein said material bonds to the adhesive;

(c) frame means mounted to a support surface adjacent the dispensing means and coating means and including first and second arm portions for supporting said film media in



suspension therebetween and above said support surface and including indicia means for individually aligning coated fingers to the adhesive layer of said film media as the fingers are brought into contact with the adhesive layer, whereby an opaque image of each finger is obtained at predetermined surface locations of said film media; and

(d) carrier support means mounted adjacent said frame means for supporting a print carrier to permit the alignment of an imaged adhesive layer to the print carrier prior to bonding the adhesive layer to said print carrier.

5,067,750

COAXIAL CABLE SCREW CONNECTOR ATTACHMENT

Timothy A. Minneman, 7325 E. Heather Way, Everett, Wash. 98203

Filed Dec. 5, 1989, Ser. No. 446,350
Int. Cl.[5] F16L *37/08*
U.S. Cl. 285—38 **9 Claims**

1. In a fitting assembly including a coaxial cable having an end and a female connector having a collar portion affixed to the end of the coaxial cable and an internally threaded portion rotatably mounted on and carried by such collar portions and opening away from such end of the coaxial cable for reception of an externally threaded male coaxial fitting component therein, such internally threaded rotatable portion of such female connector having outward projecting flattened sides forming a noncircular outer periphery, the improvement comprising an attachment fittable on the female connector and including a body having a central cavity of a shape complemental to the noncircular outer periphery of the female con-

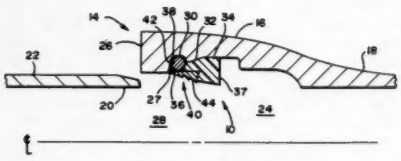
nector rotatable portion for reception of the female connector rotatable portion in said central cavity in nonrotative relationship relative thereto, said attachment body having an end opening of a size and positioned so as not to interfere with passage of the externally threaded male component therethrough for reception in the internally threaded rotatable female connector portion, said body further having stop means for limiting insertion of the female connector rotatable portion into said body central cavity and a lip projecting inward into said central cavity which lip is positioned to engage over the outward-projecting flattened sides of the rotatable portion of the female connector when fitted into said central cavity of said attachment body against said stop means for normally retaining the female connector rotatable portion in said central cavity, and grasping means projecting from said body for manual grasping and turning thereof to turn said body and thereby turn said female connector rotatable portion.

5,067,751

GASKET FOR FIELD ADAPTABLE PUSH-ON RESTRAINED JOINT AND JOINT THUS PRODUCED

Van T. Walworth, Warrior, and Steve L. DeBoalt, Birmingham, both of Ala., assignors to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Jul. 27, 1990, Ser. No. 558,441
Int. Cl.[5] F16L *17/02*
U.S. Cl. 285—105 **39 Claims**



31. A self-actuating restraining gasket adapted to retain a spigot end of a first section of a piping element within a bell end of a second section of a piping element comprising:

an annular ring of elastomeric material, said annular ring being adapted to seat in an annular recess in an interior of said bell, a front end of said ring being adapted to be disposed nearest an opening at the bell end of said second piping element,

a plurality of associated pairs of retaining elements, said associated pairs of retaining elements being spaced apart around a circumference of said elastomeric ring, said associated pairs of retaining elements being captively retained in said elastomeric ring;

each of said plurality of pairs of associated elements comprising a backing member disposed in said front end of said annular ring adjacent a radial outer surface of said front end, and an associated wedge member disposed radially inwardly of said backing member, each of said wedge members having at least one tooth disposed on an inner surface thereof, at least a gripping portion of each of said at least one tooth on each wedge member being exposed to engage a spigot end of a first piping element to be inserted into a bell end of a second piping element in which said annular ring is adapted to be disposed.

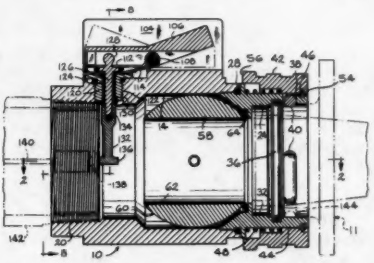
5,067,752

DRY BREAK COUPLING

Randolph L. Maiville, Onondaga, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 28, 1990, Ser. No. 619,374
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—119 **6 Claims**

1. A fluid coupling comprising, in combination, a body having an axis, a hose connection end, a coupling connection end, a passage connecting said ends and releasable coupling retaining means adjacent said coupling connection end, said body having an exterior surface, an electric switch handle pivotally mounted upon said body exterior surface selectively pivotal between open and closed positions, an electric terminal mounted upon said body adjacent said switch handle, said



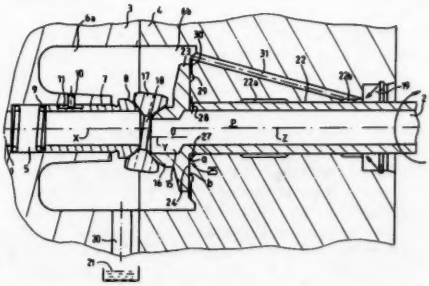
terminal including an enlarged conductive head, a spring contact mounted on said switch handle adapted to snap over said terminal head and remain in contact therewith at said closed position, a first conductor electrically connecting said contact to said body, and a second conductor connected to said terminal.

5,067,753

HYDROSTATICALLY BALANCED ROTARY HYDRAULIC CONNECTOR

Louis C. Porel, rue de Moulins, Jeanmenil 88700 Rambervillers, France

Filed May 18, 1990, Ser. No. 525,749
Claims priority, application France, May 31, 1989, 8907168
Int. Cl.[5] F16L *27/00*; F01B *9/00*; F04B *1/00*
U.S. Cl. 285—279 **11 Claims**



1. A fluid-tight connecting device for connecting a fixed hydraulic pipe with a rotary hydraulic pipe, wherein the fixed pipe **(1)** has a longitudinal axis X and a tubular piston **(7)** at its end which is axially movable in said fixed pipe **(1)** and prevented from rotating, said piston **(7)** being provided with a hemispherical head **(8)** and having a bore extending therethrough, while the rotary pipe **(2)** has a longitudinal axis Z and a terminal portion **(15)** provided with a hemispherical head **(16)**, a rotary core piece **(17)** having a central aperture **(18)** being interposed between said hemispherical heads, said core piece **(17)** being formed with two opposed concave conical bearing surfaces for substantially fluid-tight engagement with said hemispherical heads **(8, 16)** respectively characterized in that the terminal portion **(15)** has a longitudinal axis (Y) that is parallel to and offset from the respective axes (X) and (Z) of the pipes **(1)** and **(2)**, said hemispherical head of said terminal portion being laterally offset from said hemispherical head of said piston and the core piece **(17)** adjusts to compensate therefor.

5,067,754

SWIVELABLE QUICK CONNECTOR ASSEMBLY

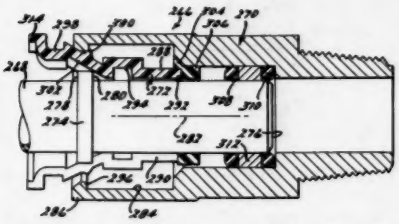
Donald D. Bartholomew, Marine City, Mich., assignor to Propietary Technology, Inc., Southfield, Mich.

Continuation of Ser. No. 303,975, Jan. 27, 1989, abandoned, which is a continuation of Ser. No. 864,761, May 19, 1986, abandoned, which is a division of Ser. No. 360,201, Mar. 22, 1982, Pat. No. 4,601,497, which is a continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Dec. 12, 1989, Ser. No. 453,378

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[5] F16L *37/12*

U.S. Cl. 285—319 6 Claims



1. In combination in a coupling for use in communicating a fluid media and comprising male, female, retainer, sealing and bushing elements,

said male element being generally tubular shaped and including:

(a) a first axially extending portion having a relatively smooth cylindrical exterior surface and disposed adjacent the terminal end of said male element,

(b) a second axially extending portion of enlarged diameter disposed axially outwardly from said first portion and adapted for engagement with said retainer element,

(c) a third axially extending portion disposed axially outwardly from said second portion and having an outer diameter smaller than the outer diameter of said second portion,

said sealing element being of an annular configuration and disposed in axial registry with said first axially extending portion of said male element and having an inner diameter sealing engaged with said exterior surface thereof,

said female element having an internal chamber adapted for operative reception of at least a portion of said male element and comprising;

(a) a first annular portion communicable with a fluid passage and adapted to receive the terminal end of said male element;

(b) a second annular portion disposed axially outwardly from said first annular portion and having a diameter greater than said first annular portion and comprising a cylindrical wall adapted for sealing engagement with the outer diameter of said sealing element,

(c) a third annular portion disposed axially outwardly from said second annular portion and having a diameter at least as great as the outer diameter of said sealing element and adapted to operatively receive said retainer element, said third annular portion having means defining at least one radially extending surface cooperable with said retainer element for securing the same within said coupling and preventing disassembly of said male element from said female element,

said bushing element being interspaced between said sealing element and said retainer element and being retained at least partially within said second annular chamber portion of said chamber upon disassembly of said retainer and male element from said female element,

said retainer element comprising;

(a) at least one, relatively deformable portion extending substantially parallel to the axis of said male element and adapted to orient said bushing element in operative position within said second annular chamber portion,

(b) at least one relatively non axially deformable portion extending between the axially outer side of said enlarged diameter portion of said male element and said radially extending surface of said female element and thereby maintaining said retainer element within said chamber and preventing withdrawal of said male element from said female element,

(c) said relatively deformable portion of said retainer being sufficiently long and deformable to allow sufficient radial movement of said relatively non-deformable retainer portion to permit said non-deformable portion to be biased radially outwardly by said enlarged diameter portion of said male element as said male element is inserted axially into said chamber, and to cause said relatively non-deformable portion to snap radially inwardly adjacent the axially outer side of said enlarged diameter portion when said male element is operatively positioned within said chamber.

5,067,755

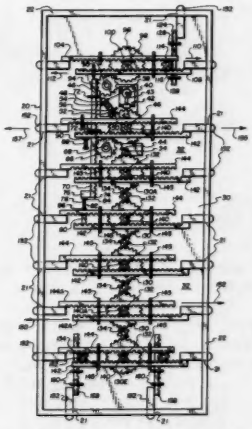
LOCKING MECHANISM FOR A SAFE DOOR

C. Thomas James, 460 N. 880 East, Springville, Utah 84663

Continuation of Ser. No. 374,257, Jun. 30, 1989, abandoned. This application Jan. 7, 1991, Ser. No. 638,068

Int. Cl.[5] E05C *9/12*

U.S. Cl. 292—33 10 Claims



1. A locking mechanism for use with a safe door enclosed in a frame, said locking mechanism comprising:

a drive shaft journaled through said safe door, a first end of

said drive shaft having handle means associated therewith adapted for a grasping and rotation of said drive shaft by a user;

a first drive gear mounted on a second end of said drive shaft;

a second drive gear rotatably mounted on said safe door spacedly positioned from said first drive gear;

a securement means mounted on said safe door, between said first and second drive gears, for intercooperating with said first drive gear and locking same in a fixed non-rotating orientation;

a pair of pinion gears, mounted spacedly apart and rotatably on said safe door, each pinion gear being mechanically engaged respectively with one of said drive gears;

a pair of first auxiliary drive gears, each auxiliary drive gear being mounted coaxially and respectively on one of said drive gears;

a first rack gear slidably mounted on said safe door, said first rack gear being engaged with said pinion gears to provide a mechanical linkage therebetween;

two second rack gears, each second rack gear being slidably mounted on said safe door, one said second rack gear being mechanically engaged with a respective said auxiliary drive gear;

a pair of first retaining studs, one first stud being mounted on each of said second rack gears, said first retaining studs being adapted to interact with a frame of said safe door upon a first sliding displacement of its said second rack gear to form a locking engagement therewith;

wherein a rotation of said drive shaft effects said first sliding displacement of said second rack gears through intermediation of said pinion gears, said first rack gears and said first and second drive gears and said pair of auxiliary drive gears.

5,067,756

Patent Not Issued For This Number

5,067,757

PANIC EXIT DEVICE HAVING NOISE SUPPRESSION

Richard B. Cohrs; Paul J. Haeck, and Gary R. Jacobs, all of Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Continuation of Ser. No. 390,449, Aug. 2, 1989, abandoned, which is a continuation of Ser. No. 188,737, Apr. 29, 1988, abandoned, which is a continuation of Ser. No. 944,744, Dec. 22, 1986, abandoned. This application Jul. 30, 1990, Ser. No. 562,417

Int. Cl.[5] E05B *65/10*

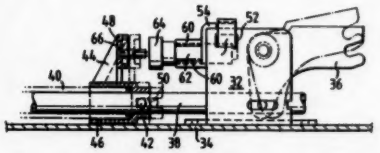
U.S. Cl. 292—336.3 **6 Claims**

1. A panic exit device means for operating a latch having noise suppression, comprising:

a base including means defining a bearing surface;

a push pad operating means journalled to said base including a linear translating action rod means whereby translation of said rod in opposite axial directions operates a latch bolt in an opening direction and a locking direction; and

shock absorber means having a viscous fluid damped spring



extended plunger coupled to one and bearing without attachment on the other of said rod and said bearing surface for damping and shock absorbing axial translation of said rod in said locking direction without impeding its operation in said opening direction and for limiting linkage slack in both said opposite axial directions of said rod.

5,067,758

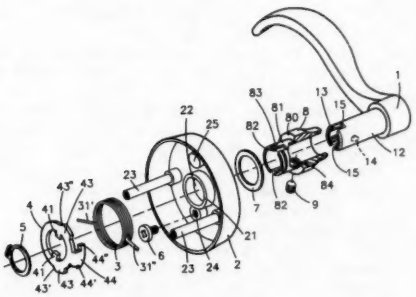
LOCK HANDLE ASSEMBLY WITH LIMITED ANGULAR MOVEMENT

Yaw-Shin Fann; Ming-Shyang Chiou, and Ching-Chuan Kuo, all of Chia-Y, Taiwan, assignors to Tong-Lung Metal Industry Co., Ltd., Chia-Yi, Taiwan

Filed Dec. 21, 1990, Ser. No. 632,139

Int. Cl.[5] E05B *1/00*

U.S. Cl. 292—347 **3 Claims**



1. A lock handle assembly comprises:

a casing having a central hole;

a sleeve rotatably fitted in said central hole, and having an inner and outer end respectively extending inwardly and outwardly from said central hole;

a lever handle having a rotary shaft detachably fitted in said sleeve and rotatable together with said sleeve;

a rotary plate mounted on said sleeve inside said casing, said rotary plate having a radially extending forward engaging member and two radially extending backward engaging

members angularly spaced from said forward engaging member at two sides of said forward engaging member;

a left and right female screw member extending axially inward from said casing at two diametrically opposite positions relative to said sleeve member;

a coiled torsion spring disposed inside said casing around said central hole and having a left radial leg to engage said left female screw member and a right radial leg to engage said right female screw member;

a first stop member extending axially inward from said casing between said female screw members;

a second releasable stop member extending axially inward from said casing between said female screw members and opposite to said first stop member;

said rotary plate being selectively set at one of a first operative position and a second operative position, said forward engaging member being adjacent to said left female screw member when in said first operative position, said forward engaging member being adjacent to said right female screw member when in said second operative position;

said forward engaging member moving toward said first stop member carrying said left radial leg of said torsion spring away from said left female screw member when said rotary plate is turned while it is in said first operative position,

one of said backward engaging members moving toward said second releasable stop member by the action of said left radial leg when said rotary plate is released, the angular movement of said handle being limited by said forward engaging member and said one backward engaging member,

said forward engaging member moving toward said first stop member carrying said right radial leg of said torsion spring away from said right female screw member when said rotary plate is turned while it is in said second operative position,

the other one of said backward engaging members moving toward said second releasable stop member by the action of said right radial leg when said rotary plate is released while it is in said second operative position,

the angular movement of said handle being limited by said forward engaging member and said other one of said backward engaging member when said rotary plate is in said second operative position,

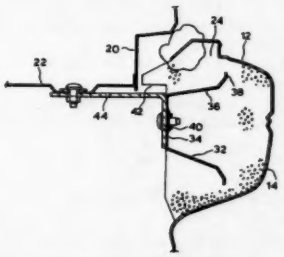
said lever handle being detachable from said sleeve, thereby permitting said handle to be replaced by a new handle to match the used position of said rotary plate.

5,067,759

VEHICLE BUMPER ASSEMBLY WITH FOAMED CORE

Stephen D. Fleming, Rayleigh, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 858,486, Apr. 30, 1986, Pat. No. 4,988,137. This application Oct. 15, 1990, Ser. No. 597,632
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] B60R *19/18*
U.S. Cl. 293—109 **3 Claims**



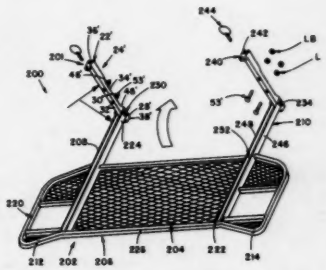
1. A vehicle bumper assembly comprising a channel-section outer shell of injected moulded plastics material for extending transversely across the front or rear of a motor vehicle and having integral end portions for extending along the sides of the motor vehicle, and spaced apart mounting brackets for mounting the bumper on the motor vehicle, wherein a transversely extending portion of the outer shell is substantially filled with an energy absorbing foam adhered to the inside of the outer shell; and the mounting brackets have apertured arm portions spaced apart from the outer shell and moulded into said foam, and the mounting brackets have support portions extending from the foam for directly attaching the bumper to the motor vehicle.

5,067,760

PLATFORM/GRILL COVER UNIT FOR USE ON A LAND VEHICLE

Daniel E. Moore, and Dolores Moore, both of 6444 Neibauer Rd., Rte. 1, Billings, Mont. 59106

Filed Mar. 6, 1991, Ser. No. 665,561
Int. Cl.[5] B60R *19/52*
U.S. Cl. 293—115 **1 Claim**



1. A device for use on a front bumper of a land vehicle comprising:

A) a base unit fixed to a front bumper of a land vehicle, said base unit including

(1) a body having a top end, a bottom end, a top section, a bottom section, a planar front surface which faces forwardly of the land vehicle front bumper, and a concave rear surface located adjacent to the front bumper, said rear surface having a top portion, a bottom portion, and a planar central portion connecting said top portion to said bottom portion, said top and bottom portions converging towards each other towards said front surface, said central portion extending parallel to said front surface, and

(2) fasteners releasably attaching said base unit body to the vehicle bumper;

B) a platform/grill cover unit which includes

(1) a body which includes

(a) a rectangular central section having two sides and two ends,

(b) said ends each extending beyond one of said sides and each having a bolt hole defined therethrough, said sides being hollow,

(c) two identical wing sections, each wing section including

(i) a parallelogram shaped frame having one side formed by one end of said rectangular central section and further including a second side and two ends, and

(ii) a square shaped frame having one end formed by said rectangular central section one end, a second end formed by said second side of said parallelogram shaped frame, and two other ends, with one of said other ends being a linear extension of one of said central section sides,

(d) a triangular mesh system formed between each

square shaped frame and one end of said parallelogram shaped frame in each wing section,

(e) a trapezoidal mesh system formed between each square shaped frame and the other side of said parallelogram shaped frame in each wing section, and

(f) a rectangular mesh system in said central section and covering an inner area within said rectangular central section;

C) fastening means on each of said sides of the central section pivotally attaching said platform/grill cover unit to said base unit body section;

D) a lock element mounted on said base unit body adjacent to said body top end and including a projection element for engaging said platform/grill cover unit when said cover unit is in an upright position; and

E) a stop element fixed to said base unit body adjacent to said base unit body bottom end for abuttingly engaging said platform/grill cover unit when said unit is in a deployed condition.

5,067,761

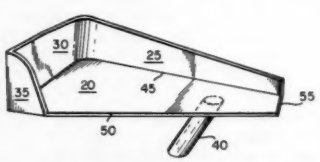
MASONRY HAWK

James I. Blowers, 10016 Washington Rd., Glen Allen, Va. 23060

Filed Aug. 1, 1990, Ser. No. 561,186

Int. Cl.[5] E04G *21/02*

U.S. Cl. 294—3.5 **3 Claims**



1. A masonry hawk device for holding a supply of mortar or the like comprising a platen on top of which mortar is to be held with handle means extending down from the bottom side thereof for holding the device with one hand while working with an applicator such as a trowel in the other; said platen having front and rear edges and right and left side edges, said rear edge and one of said side edges being substantially bounded by upwardly extending walls, said walls intersecting and being joined at a rear corner of the platen to form an unbroken retaining wall along said rear edge and one side edge, a short upwardly extending side wall extending from said rear wall along a minor portion only of the other side edge, a major portion of said other side edge being unbounded, and said front edge being unbounded, said handle means being positioned on said platen forward of the midpoint thereof whereby the loaded hawk may be simultaneously supported by the worker's hand holding the handle and the worker's arm contacting the rear portion of the device.

5,067,762

NON-CONTACT CONVEYING DEVICE

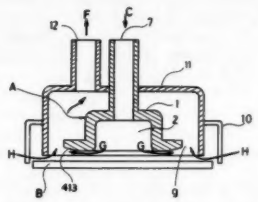
Hiroshi Akashi, 7-12, Kitasakurazuka 2-chome, Osaka-fu, Toyonaka, Japan

Continuation-in-part of Ser. No. 103,361, Oct. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,254, Jan. 14, 1987, abandoned, which is a continuation of Ser. No. 875,712, Jun. 18, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 343,344

Claims priority, application Japan, Jun. 18, 1985, 60-132650; Jul. 27, 1985, 60-166145; Aug. 14, 1985, 60-178777; Sep. 7, 1985, 60-198730; Sep. 19, 1985, 60-208284; Dec. 30, 1985, 60-297489; Feb. 17, 1986, 61-34048; Apr. 21, 1986, 61-91652; May 12, 1986, 61-108197

Int. Cl.[5] B25J *15/06*

U.S. Cl. 294—64.3 **8 Claims**



1. A pick-up head for a non-contact conveying device, said pick-up head comprising:

an upper wall;

a side wall surrounding said upper wall;

an operating surface formed at a lower annular edge of said side wall, said operating surface being positionable adjacent an article to be lifted;

mans for providing a reduced pressure in an area formed within said upper wall and said side wall; and

means for introducing a positive pressure gas supply into said pick-up head, said means for introducing including an opening disposed approximately at the center of said upper wall and said means for providing a reduced pressure including a cushion-vacuum room fully opened at the bottom of said pick-up head and of a sufficient depth to achieve a reduced pressure therein when said pick-up head is positioned adjacent an article to be lifted and said opening being positioned transverse with respect to a plane in which said annular edge exists for introducing a positive pressure gas supply into said cushion-vacuum room and over said operating surface, the diameter of said opening being smaller than that of said cushion-vacuum room, such that positioning of said pick-up head adjacent an article to be lifted produces a combined effect including an increased rate of gas flow over said operating surface and a reduced pressure within said cushion-vacuum room, thereby enabling non-contact pick-up of an article whose diameter is greater than that of said operating surface.

5,067,763

PARTS SUPPLYING APPARATUS

Yoshitaka Aoyama, 20-11, Makitsukadai 2-chome, Sakai, Osaka 590-01, Japan

Division of Ser. No. 210,490, Jun. 23, 1988, Pat. No. 4,943,098. This application Feb. 16, 1990, Ser. No. 481,027

Claims priority, application Japan, Jun. 26, 1987, 62-160477; Sep. 5, 1987, 62-222839; Oct. 9, 1987, 62-255567; Oct. 16, 1987, 62-262488

Int. Cl.[5] H02N *15/00*

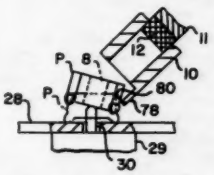
U.S. Cl. 294—65.5 **7 Claims**

1. A method for supplying a projection nut, comprising the steps of:

supporting a projection nut at an end portion of a supply rod with an end projection thereof, said end projection being U-shaped and fixed to an outer rod of said supply rod;

advancing a supply rod obliquely downward or substantially horizontal with a projection nut attracted at an end portion thereof by a magnetic force while supporting the projection nut from below at the end portion thereof;

stopping the advance movement of the supply rod immediately before a predetermined destination; and



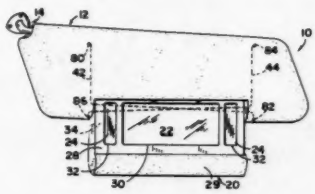
eliminating the magnetic force on the projection nut at substantially the same time as the step of stopping the supply rod advance movement to thereby allow the projection nut to pivot about an end corner provided by the U-shaped end projection at the end portion of the supply rod so as to fit through a guide pin of a stationary electrode waiting thereunder.

5,067,764

VISOR WITH EXTENDABLE PANEL

Michael L. Lanser; Steven E. VanderVeen, and David J. Becker, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Oct. 26, 1990, Ser. No. 604,680
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.5 **21 Claims**



1. An vehicle visor comprising:

a visor body including slot means formed along a lower edge thereof and extending within said visor body for receiving a slide-out panel, said slot means defining opposing sides therein;

means for mounting said visor body to a vehicle for movement between a raised stored position and a lowered use position;

a panel shaped to fit within said slot means of said visor body;

means for slideably mounting said panel to said visor body for movement between a stored position within said visor body and a use position extended from said visor body; and

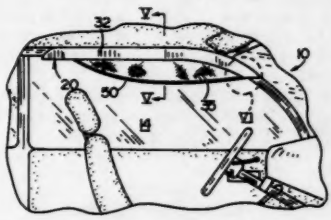
means for stabilizing said panel within said visor including a channel means mounted to said panel means and extending toward said opposing sides of said slot, and a first and a second cord; wherein said first cord is anchored at diagonally opposing points along said opposing sides of said slot and extending transversely between said opposite sides through said channel member; and wherein said second cord is anchored at corresponding diagonally opposite points along said opposing sides of said slot and extending transversely between said opposite sides through said channel member; whereby said first and second cords slide in opposite directions through said channel means as said panel is moved between said stored position and said extended use position to stabilize the sliding movement of said panel.

5,067,765

FLEXIBLE SUN VISOR WITH OVER-CENTER SPRING

Dale J. Frye, and Michael J. Suman, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Jul. 24, 1989, Ser. No. 383,543
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.8 **22 Claims**



1. A visor for a vehicle comprising:

a membrane forming a visor and having a first end secured to the vehicle adjacent a window;

a frame associated with said vehicle window at least at one side thereof; and

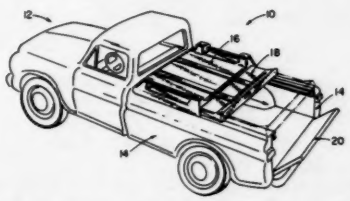
a moveable member including over-center means, said moveable member attached to said membrane at an end of said membrane opposite said first end, said moveable member moveable between at least two stable positions with the first stable position in which said membrane is collapsed in a stored position adjacent said one side of the window and the second stable position spaced from said first stable position and in which said membrane is extended to a lowered use position for at least partially blocking sunlight entering the window.

5,067,766

TELESCOPING COVER FOR A PICKUP TRUCK BED

Olaf K. Lovaas, 2008 Westley Ct., Safety Harbor, Fla. 34695

Continuation-in-part of Ser. No. 527,382, May 23, 1990, abandoned. This application Apr. 15, 1991, Ser. No. 685,187
Int. Cl.[5] B60P *7/02*
U.S. Cl. 296—100 **16 Claims**



1. A pickup truck bed cover, comprising:

a slideably mounted forward panel;

a slideably mounted rearward panel;

a pair of elongate track members fixedly secured to opposite inner side walls of said pickup truck bed;

a first transversely disposed "U"-shaped axle member positioned at a trailing end of said rearward panel in underlying relation thereto;

a transversely disposed, linear in configuration axle member positioned at a leading end of said rearward panel in underlying relation thereto;

a second transversely disposed "U"-shaped axle member positioned at a leading end of said forward panel in underlying relation thereto;

a first pair of laterally moveable, rotatably mounted wheel members positioned at opposite ends of said first "U"-shaped axle member and rollingly engaging said track members;

a second pair of laterally moveable, rotatably mounted wheel members positioned at opposite ends of said linear axle member and rollingly engaging said track members;

a third pair of laterally moveable, rotatably mounted wheel members positioned at opposite ends of said second "U"-shaped axle member and rollingly engaging said track members;

said rearward panel being telescopically received by said forward panel when said rearward panel is unmoved and said forward panel is slid rearwardly and when said forward panel is unmoved and said rearward panel is slid forwardly;

whereby the lateral moveability of said first, second, and third pair of wheel members accommodates said truck bed cover to differing widths of truck beds.

5,067,767

TARPAULIN COVER

Vito Biancale, R.R. #2, Dundas, Ontario, Canada

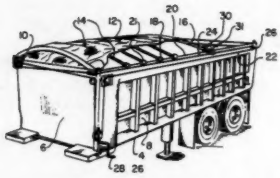
Filed Feb. 5, 1988, Ser. No. 152,623

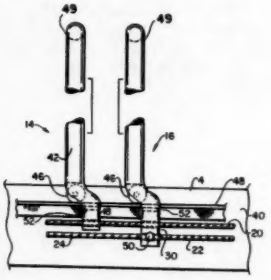
Claims priority, application Canada, Jul. 23, 1987, 542787

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] B62D *25/06*

U.S. Cl. 296—100 **6 Claims**





1. A tarpaulin cover system for open-top flatbed truck or trailer bodies having a body front and a floor with floor sides, said system comprising:

a tarpaulin having a front end anchored to said body front, and a rear end;

a plurality of intermediate bows extending transversely across said body and secured at spaced locations to said tarpaulin for supporting said tarpaulin, said intermediate bows having intermediate bow ends;

a lead bow secured to said rear end and having lead bow ends;

longitudinally extending tracks mounted on said floor sides;

said lead bow and intermediated bows each having an inverted U-shape defined by a transverse bridging central portion and two similar arms extending downwardly from said central portion and terminating in free ends, and rollers mounted on said arms at similar distances from said free ends, said rollers being supported by said tracks; and

bow support means for supporting said intermediate bows and lead bow, said bow support means for reciprocating said lead bow thereby moving said tarpaulin and said intermediate bows between a covered position wherein said body is covered by said tarpaulin and an open position wherein said body is open, said bow support system including

a pair of linear, semi-rigid cable members secured immovably to said body and extending longitudinally along said body, with said intermediate bow ends being slidably mounted and supported on said cable members for longitudinal movement; and

separate, movable drive cable means for supporting said lead bow ends and having drive portions extending longitudinally along said body in parallel to said immovable cable means, said lead bow being fixedly secured to said movable drive cable means, whereby longitudinal movement of said movable drive cable means causes said lead bow to move for opening or closing said tarpaulin.

5,067,768

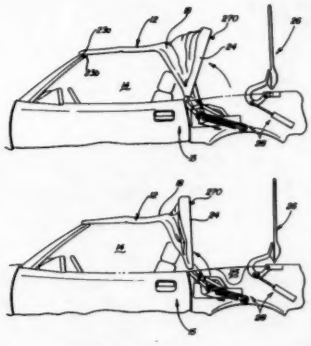
POWER CONVERTIBLE TOP WITH AUTOMATIC TOP AND TONNEAU SEQUENCING

Roderick C. Fischbach, Adrian, Mich., assignor to Wickes Manufacturing Company, Southfield, Mich.

Filed Oct. 23, 1989, Ser. No. 425,271

Int. Cl.[5] B60J *7/08*

U.S. Cl. 296—107 **11 Claims**



1. A power convertible assembly for a passenger vehicle having a body, a passenger compartment in the body, a windshield having a header, a convertible top movable between raised and lowered positions to cover and uncover the passenger compartment, a storage compartment within the body for receiving the top in its lowered position, a tonneau movable between closed and open positions with respect to the body to open and close a path for movement of the top between its raised and lowered positions, the tonneau being in its closed position in both the raised and lowered top positions; and wherein the top has a foldable cover and a collapsible framework for the cover including a front bow engageable with the header, and a rear bow movable between raised and lowered positions and engageable with the vehicle body in the top raised position, and latch means on the body and the rear bow for latching the rear bow to the body, characterized by; power actuating means for automatically moving the top and tonneau in a stepped sequence from a top lowered position, to a top raised position the sequence including moving the tonneau from its closed position to a raised open position, thereafter moving the top from its lowered position to a raised position wherein the rear bow of the top is partially raised, then moving the rear bow of the top to its fully raised position to provide

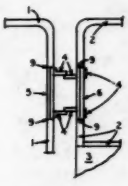
clearance for return movement of the tonneau to its closed position, moving the tonneau to its closed position through the clearance provided by the fully raised rear bow and finally moving the rear bow to its lowered position in engagement with the vehicle body.

5,067,769

DUCT-WAY BETWEEN A PICKUP TRUCK CAB AND A BED CAP, BOTH WITH SLIDING GLASS WINDOWS

John R. Benchoff, P.O. Box 223, Blue Ridge Summit, Pa. 17214-0223, assignor to John Rex Benchoff, Blue Ridge Summit, Pa.

Filed Apr. 16, 1990, Ser. No. 509,606
Int. Cl.[5] B60P *3/32*
U.S. Cl. 296—166 **1 Claim**



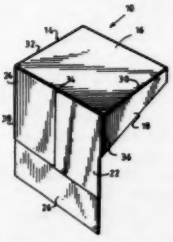
1. A combination of ductway and sliding windows of a cap (camper)/truck cab, said ductway comprising a telescopically adjustable 2 piece, clear plastic enclosure units for an opening each connected directly to the sliding glass window frames, not depending on the parallel surfaces of the cab/cap, one of said units being screwed to the outside of the cab frame of the sliding glass window with a clear seal to make a weather seal, the other of said units extending through the open sliding glass window of the cap/camper and screwed to the inside of the window frame with sealer also making this side weather sealed, the ductway units interengaging with telescoping surfaces which have a seal, all being of clear see-through plastic or plexiglass.

5,067,770

SUN SHIELD FOR A CHILDS CAR SEAT

Edwin Hassell, Jr., P.O. Box 850, Nesconset, N.Y. 11767

Filed Dec. 24, 1990, Ser. No. 633,462
Int. Cl.[5] A47C *7/62*
U.S. Cl. 297—184 **8 Claims**



1. A sun shield for a childs car seat comprising:

a) a single flat piece of pre-cut firm bendable material having a roof segment, a pair of side visor segments, a pair of support flap segments and a back segment, with a cut out gap area between each said support flap segment and said back segment;

b) a first machine-made fold line between said roof segment and said first side visor segment;

c) a second machine-made fold line between said roof segment and said second side visor segment;

d) a third machine-made fold line between said roof segment and said back segment;

e) a fourth machine-made fold line between said first side visor segment and said first support flap segment;

f) a fifth machine-made fold line between said second side visor segment and said second support flap segment; and

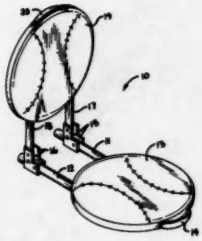
g) means for securing said support flap segments to the rear surface of said back segment when said bendable material is folded up along all said fold lines to form said sun shield so that said back segment can be adjustably placed between the backrest of the car seat and a seat back of a rear seat of an automobile with said roof segment extending over the head of the child to protect the head from rays of the sun entering through the windows of the automobile and not obstruct the rear view mirror for the driver of the automobile.

5,067,771

STADIUM SEAT APPARATUS

Christopher M. Ellis, 7475 Cedar Chase, Apt. 3, Stockton Blvd., Sacramento, Calif. 95823

Filed Dec. 31, 1990, Ser. No. 636,184
Int. Cl.[5] A47C *4/54*
U.S. Cl. 297—378 **1 Claim**



1. A stadium seat apparatus comprising, in combination,

a right seat frame leg and a left seat frame leg, wherein the right and left seat frame legs are coextensive and parallel relative to one another, and

a right backrest frame leg and a left backrest frame leg, wherein the right backrest frame leg is pivotally mounted to the right seat frame leg, and the left backrest frame leg is mounted to the left seat frame leg, and

a padded seat member of a predetermined cylindrical configuration mounted to the right and left seat frame legs, and

a padded backrest defined by a further configuration equal to the predetermined cylindrical configuration mounted to the right and left backrest frame legs, and

a first handle mounted to a side wall of the padded seat member, and a second handle mounted to a further side wall defined by the padded backrest wherein the padded seat member and the padded backrest are orthogonally aligned relative to one another in a first position, and wherein the padded seat member and the padded backrest are coaxially aligned and coextensively arranged relative to one another in a second collapsed position, and

the first handle and the second handle are coextensively aligned relative to one another in the second position and

wherein the padded backrest defines a pneumatic chamber and includes a first inflation valve mounted to the padded backrest to effect selective inflation of the pneumatic chamber, and a further pneumatic chamber defined by the padded seat member and the padded seat member includes a second inflation valve in communication with the further pneumatic chamber to effect selective inflation of the further pneumatic chamber, and

wherein the padded seat member includes a heating chamber diametrically aligned with the padded seat member and coextensive therewith underlying the further pneumatic chamber, wherein the further pneumatic chamber is of a

generally "C" shaped cross-sectional configuration, and the heating chamber includes a heating means therewithin including a series of parallel heating coils cooperative with a battery member to effect heating of the heating member and the further pneumatic chamber, and

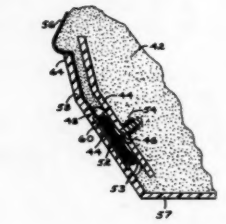
wherein the further pneumatic chamber includes a right and left flexible heating conduit extending above the padded seat member, wherein the right and left flexible heating conduit each include a respective right and left socket, each socket includes an entrance opening directed into a conically configured cavity to direct heated air from the further pneumatic chamber into each socket.

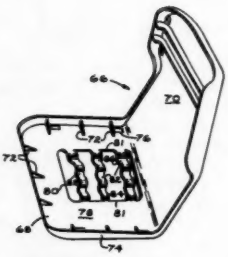
5,067,772

FOAM SEAT WITH INSERT

Chi H. Koa, Jackson, Mich., assignor to Michigan Seat Company, Jackson, Mich.

Filed Mar. 29, 1990, Ser. No. 501,003
Int. Cl.[5] A47C 7/02
U.S. Cl. 297—452 **3 Claims**





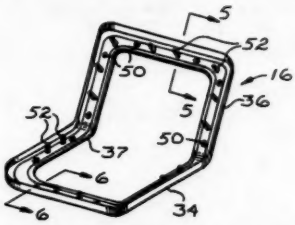
1. A molded seat comprising, in combination, a pan formed of a molded synthetic plastic material, having a bottom portion and an integral back portion, said portions each including an inner surface, resilient foam bottom and back cushion portions mounted upon said pan bottom and back portions, respectively, said cushion portions each including an inner surface in opposed relationship to the associated pan portion inner surface, a plurality of fasteners interposed between said associated pan and cushion portions, each of said fasteners including a first element integrally molded into a pan portion and the material thereof and extending from the associated pan portion inner surface and a second element affixed to a cushion portion and extending from the associated cushion portion inner surface, one of said fasteners' elements including a plurality of loops and the other associated element including a plurality of deformable hooks releasably interconnecting with said loops whereby said fasteners releasably secure said cushion portions upon the associated pan portions, a substantially rigid cushion insert within said cushion portions, said inserts having a plurality of holes defined therein, said second fastener elements each including an elongated mounting stud having retaining means defined thereon, each stud being received within an insert hole to affix said second elements to said insert, said studs being formed of a synthetic plastic material and said retaining means defined on said studs comprising deformable barbs.

5,067,773

FOAM SEAT CUSHION WITH CLAMPED EDGES

Chi H. Koa, Jackson, Mich., assignor to Michigan Seat Company, Jackson, Mich.

Filed Sep. 4, 1990, Ser. No. 577,039
Int. Cl.[5] A47C 7/02
U.S. Cl. 297—457 **5 Claims**



1. A seat comprising, in combination, a synthetic foam cushion having top and bottom surfaces and a peripheral edge, a flexible cover attached to said cushion top surface and extending over said cushion peripheral edge and having a flexible peripheral flap extending beyond said cushion peripheral edge, said flap having a terminating edge, a substantially rigid pan having a configuration substantially similar to that of said cushion bottom surface and having a periphery and a peripheral region, spaced openings defined in said pan peripheral region inwardly of said pan periphery, a substantially closed periphery centrally open retainer separate from said pan and having a configuration similar to that of said pan peripheral region, a plurality of spaced elongated lances defined on said retainer corresponding in spacing to said pan peripheral region openings, and fastening means attaching said retainer to said pan peripheral region with said lances extending through said pan openings, said flap including a portion extending over said pan periphery and engaging said pan peripheral region, said retainer being superimposed over said flap portion whereby said flap portion is sandwiched between said retainer and said pan peripheral region and said lances penetrate said flap portion to maintain said flap portion in position prior to installation of said fastening means, said flap terminating edge being located between said retainer and said pan peripheral region wherein said retainer shields said flap terminating edge from view.

5,067,774

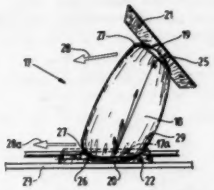
CONE SHAPED INFLATABLE BAG FOR LIFTING A LOAD

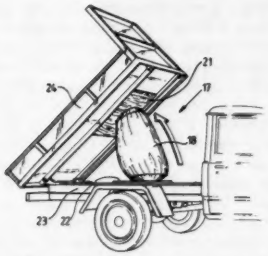
Mark G. Trowland, Buranda, Australia, assignor to Marketmont Pty, Ltd., Queensland, Australia

Filed Mar. 14, 1990, Ser. No. 493,550
Claims priority, application Australia, Mar. 17, 1989, PJ3265
Int. Cl.[5] B60P 1/16; B66F 3/35
U.S. Cl. 298—1 A **10 Claims**

1. A combination of a dump tray, an inflatable bag and a base suitable for a dump vehicle, comprising hinge means connecting the dump tray to the base to constrain the tray's movement, the inflatable bag being located between the tray and the base, such that on inflation of the bag, the base remains stationary relative to the tray and the tray is moved about the hinge means, the bag being constructed such that when fully inflated it assumes an oblique cone-like shape with a side wall defined between a rounded apical end wall and a rounded base end wall, said apical end wall and said base wall moving apart as

the bag inflates to define a direction of travel of said end walls, the bag having first coupling means connecting the apical end





wall to the tray and second coupling means connecting the base end wall of the bag to the base.

5,067,775

RETAINER FOR ROTATABLE BITS

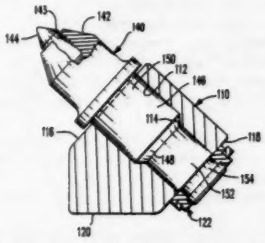
Mark D. D'Angelo, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 21, 1988, Ser. No. 184,511

The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.

Int. Cl.[5] E21C *35/18*

U.S. Cl. 299—86 **30 Claims**



28. A mining tool retainer means for rotatably retaining a mining tool in a support block bore having forward and rearward ends, with at least said rearward end being of a first diameter, said retainer comprising removable collar means consisting of at least two semiannular members each having a forward face, a flange extending from its inside diameter and a groove disposed about its outside diameter, said forward face defining at least in part said semiannular members' outside diameter which is greater than said support block bore's rearward end's first diameter, said retainer means being circumferentially mountable about a rearward end of said mining tool which rearward end extends from said support block when said mining tool is mounted in said support block bore's rearward end, said extending rearward portion of said mining tool having a groove circumferentially disposed therein, such that each said collar means flange engages said groove in said extending rearward portion of said mining tool and each said collar means groove defines in combination a substantially continuous groove about said collar means; and snap ring means removably mounted about said removable collar means in said substantially continuous groove.

5,067,776

TRACK ADJUSTMENT WHEEL

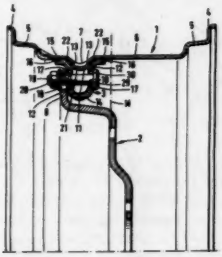
Peter Aderer, Königswinter, Fed. Rep. of Germany, assignor to Lemmerz-Werke KGaA, Konigswinter, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 270,612, Nov. 14, 1988, Pat. No. 4,925,248. This application May 14, 1990, Ser. No. 522,915

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921121

Int. Cl.[5] B60B *23/12*

U.S. Cl. 301—9 TV **14 Claims**



1. A track adjustment wheel comprising:

a central wheel disc;

a generally cylindrical peripheral rim, said rim having an axis and a base facing the wheel disc and concentric therewith;

a plurality of U-shaped holding supports circumferentially spaced around the rim base, said holding supports having legs and axially aligned bolt-holes, the legs being provided with outwardly directed flanges which lie against the rim base and at which the holding supports are welded to the rim base by welding seams extending circumferentially of the rim base;

bolts extending axially through the bolt-holes and engaging the central wheel disc to mount the central wheel disc detachably to the peripheral rim; and,

an inwardly projecting bead arranged on and extending around the rim base, said bead having a cross section substantially in the form of a flattened V;

boss-like projections being formed in the bead by locally pressed inward portions of the bead, said boss-like projections having flank portions and extending radially inwardly into the holding supports between the legs thereof with the legs axially engaged against said flank portions relieving said welding seams of stress.

5,067,777

AIR BRAKE SYSTEM FOR AN ARTICULATED RAILROAD CAR

Eugene W. Schmitt, Lockport, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed May 14, 1990, Ser. No. 522,806

Int. Cl.[5] B60T *8/30*

U.S. Cl. 303—22.6 **5 Claims**

1. A railroad air brake system for use on an articulated railroad car having end platforms and an intermediate platform, trucks supporting the platforms and separate air brake subsystems for the trucks supporting the end platforms,

the improvement comprising an air brake subsystem for the trucks supporting the intermediate platform which includes:

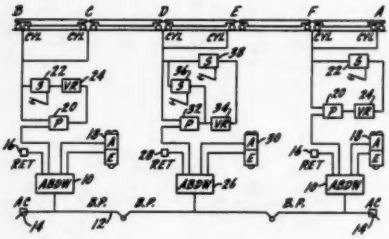
a control valve connected to a train air supply,

an air actuating means for each truck supporting the intermediate platform,

each truck supporting the intermediate platform having a sensor valve with a load sensing arm, which sensor valves are commonly connected to said air actuating means,

a proportional valve having an input connected to said control valve and an output connected to said air actuating means and said sensor valves,

a volume reservoir connected to said sensor valves and to said proportional valve,



the application of brake operating pressure from the control valve to said proportional valve, with an empty load condition at any intermediate platform truck causing the sensor valve associated therewith to cause said proportional valve to reduce the air pressure supplied therefrom to said air actuating means.

5,067,778

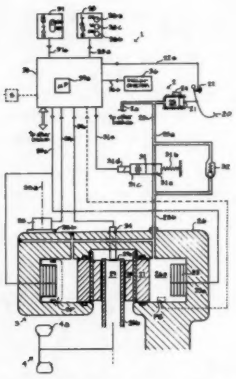
HIGH PERFORMANCE ANTI-LOCK BRAKE SYSTEM FOR ORIGINAL EQUIPMENT AND AFTER-MARKET APPLICATIONS

David A. Testardi, 7230 Pimmit Ct., Falls Church, Va. 22043

Filed Nov. 19, 1990, Ser. No. 615,260

Int. Cl.[5] B60T *8/00*

U.S. Cl. 303—113 R **20 Claims**



1. An anti-lock brake system for a vehicle comprising:

a master cylinder having a master cylinder piston mounted for reciprocal movement therein;

actuating means for moving the master cylinder piston when an operator of the vehicle operates a vehicle brake actuating device;

a wheel cylinder having a wheel cylinder piston which is mounted for reciprocal movement therein;

a rotatable brake element connected for rotation with a wheel of the vehicle;

a non-rotatable brake element interposed between the wheel cylinder piston and the rotatable brake element;

a hydraulic link comprising a volume of constrained working fluid interposed between the master cylinder piston and the wheel cylinder piston so as to hydraulically link movement of the master cylinder piston with movement of the wheel cylinder piston, whereby

when the vehicle operator operates the vehicle brake actuating device in order to slow down the vehicle, the movement of the master cylinder piston causes a corresponding movement of the wheel cylinder piston which urges the non-rotatable brake member to frictionally engage the rotatable brake member, thereby slowing down the vehicle;

valve means provided in the hydraulic link for controlling a condition of fluid communication between the master cylinder and the wheel cylinder, wherein

the valve means is controllable to selectively provide either one of a first condition which allows two way fluid communication between the master cylinder and the wheel cylinder and a second condition which allows exclusive one way fluid communication from the wheel cylinder to the master cylinder, wherein,

an upstream portion of the hydraulic link is defined between the master cylinder piston and the valve means and a downstream portion of the hydraulic link is defined between the wheel cylinder piston and the valve means, and wherein

the downstream portion of the hydraulic link defines an internal volume within which the working fluid is substantially constrained when the movement of the wheel cylinder piston has urged the non-rotatable brake member into frictional engagement with the rotatable brake member;

piezoelectric means, comprising at least one piezoelectric element to which a voltage potential is applied, for increasing and decreasing the internal volume of the downstream portion of the hydraulic link in response to changes in a magnitude of the voltage potential applied to the piezoelectric element;

wheel speed sensing means for producing a wheel speed signal indicative of a rotational speed of the wheel; and

a controller electrically connected to the valve means, the piezoelectric means, and the wheel speed sensing means;

wherein the controller comprises:

skid determining means for determining the existence of an incipient wheel skid condition at the vehicle wheel on the basis of at least the wheel speed signal;

normal braking mode control means, operative when the incipient wheel skid condition does not exist, for controlling the valve means to provide the first condition of fluid communication between the master cylinder and the wheel cylinder;

cut-off means, responsive to the determined existence of the incipient wheel skid condition, for controlling the valve means to provide the second condition of fluid communication between the master cylinder and the wheel cylinder;

piezoelectric element contracting means, operative after the second condition of fluid communication has been established, for controlling the magnitude of the voltage potential applied to the piezoelectric element so as to cause the piezoelectric element to contract, thereby increasing the internal volume of the downstream portion and reducing a hydraulic pressure in the wheel cylinder to alleviate the incipient wheel skid condition;

means for sensing an alleviation of the incipient wheel skid condition, on the basis of at least the wheel speed signal;

piezoelectric element expanding means, responsive to the sensed alleviation of the incipient wheel skid condition, for controlling the voltage potential applied to the piezoelectric element so as to cause the piezoelectric element to expand, thereby decreasing the internal volume of the downstream portion and increasing the hydraulic pressure in the wheel cylinder;

monitoring means for monitoring the voltage potential applied to the piezoelectric element by the piezoelectric element expanding means; and

normal braking resume means for controlling the valve means to provide the first condition of fluid communication between the upstream portion and the downstream portion of the hydraulic link when the voltage potential applied to the piezoelectric element by the piezoelectric element expanding means has reached a predetermined voltage potential,

wherein the valve means and the piezoelectric means are provided within a module attached to a portion of the vehicle in such a manner that the piezoelectric means is located within an auxiliary chamber of the module downstream of the valve means, wherein the upstream portion comprises a first brake line section, the downstream portion comprises a second brake line section, wherein the second brake line section comprises a flexible brake line, and wherein the module is interposed between the first brake line section and the second brake line section.

5,067,779

BRAKING PRESSURE GENERATOR FOR A VACUUM OPERATED BRAKE SYSTEM WITH ANIT-LOCK CONTROL

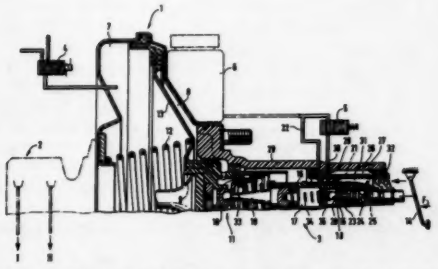
Juan Belart, Moerfelden-Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed May 4, 1990, Ser. No. 519,057

Claims priority, application Fed. Rep. of Germany, May 6, 1989, 3914955

Int. Cl.[5] B60T *08/44*

U.S. Cl. 303—114 PN **4 Claims**



1. A pedal-actuated braking pressure generator for a brake system with anti-lock control, comprising a vacuum-operated servo unit providing both boosting of braking force and generating an auxiliary energy opposed to pedal force and a master brake cylinder connected downstream thereof, wherein the pedal force is transmitted to an inlet valve of the servo unit by way of a piston arrangement connected adjacent said unit and including a pedal-side piston applied by the pedal force, a pressure transmission chamber, a reversing valve and a push-rod piston actuating the inlet valve of the servo unit, with the reversing valve closing the pressure transmission chamber in the absence of anti-lock control and, upon the onset of anti-lock control, the pedal-side piston being arrested and the reversing valve opening a pressure medium path from the pressure transmission chamber to a pressure compensation reservoir, thereby releasing the push-rod piston in a direction opposite of the pedal force.

5,067,780

VERTICAL FILING DEVICE

Brent N. Rickard, 5415 Via Carrizo, Laguna Hills, Calif. 92653

Filed Jun. 29, 1989, Ser. No. 374,009

Int. Cl.[5] B42F *7/00*

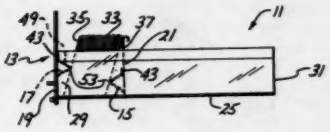
U.S. Cl. 312—193 **14 Claims**

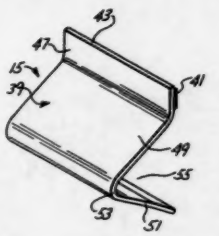
1. A file drawer system for containing and positioning a plurality of file folders comprising:

a file drawer having a forward wall, a rear wall, at least one side wall and a bottom wall, said walls defining a filing compartment which is adapted to receive the plurality of file folders with a forwardmost and a rearwardmost of the file folders facing the forward and rear walls, respectively;

forward and rear positioners for positioning the file folders so that they are in an inclined position in which they are inclined rearwardly as they extend upwardly when the file drawer is closed;

means for releasably coupling the rear positioner to any desired location on at least one of said side, rear and bottom walls without penetrating said one wall and with the rear positioner lying between the rear wall and the rearwardmost file folder and being engageable with the rearwardmost file folder;





means for releasably coupling the forward positioner to any desired location on at least one of said forward, side and bottom walls without penetrating the wall to which the forward positioner is coupled; and

said forward positioner being between the forwardmost file folder and the forward wall and being engageable with the forwardmost file folder.

5,067,781

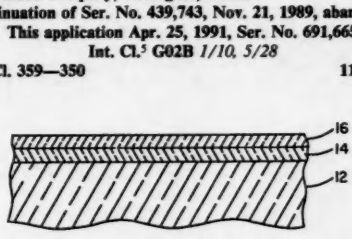
OPTICAL ELEMENTS AND METHOD OF MANUFACTURE

Dennis G. Montanari, Townsend; Richard L. Gentilman, Acton, and Randal W. Tustison, Lexington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 439,743, Nov. 21, 1989, abandoned. This application Apr. 25, 1991, Ser. No. 691,665

Int. Cl.[5] G02B *1/10, 5/28*

U.S. Cl. 359—350 **11 Claims**



1. An optical element, comprising:

a base comprising a first material having a first predetermined optical transmittance over at least a portion of the optical range of about 2 microns to 30 microns; and

a coating layer disposed over said base comprising a refractory oxide, said coating layer having a first region comprising the material of said base layer and said refractory oxide, and a second region of said refractory oxide dis-

posed over said first region with the first region of the coating layer having a graded composition, with the proportion of the material of the base declining as a function of increasing thickness of the first region, while the proportion of the refractory oxide in the first region increases as a function of increasing thickness of the first region.

5,067,782

APPARATUS FOR PRODUCING A DISTORTION-FREE TWO-DIMENSIONAL IMAGE OF A SCANNED OBJECT

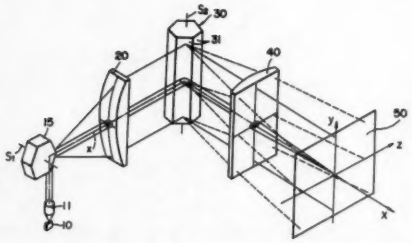
Akira Morimoto, Tokyo, and Takashi Iizuka, Shiki, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 547,208, Jul. 3, 1990, abandoned, which is a division of Ser. No. 288,980, Dec. 23, 1988. This application Jan. 31, 1991, Ser. No. 649,313

Claims priority, application Japan, Dec. 23, 1987, 62-326274; Dec. 23, 1987, 62-326275; Jan. 12, 1988, 63-4423

Int. Cl.[5] G02B *26/08*

U.S. Cl. 359—202 **7 Claims**



1. An optical device for scanning a predetermined surface which is defined by first and second axes that are perpendicularly arranged with respect to each other, and for creating a two-dimensional image on said surface, said device comprising:

means for emitting a light beam in a predetermined direction;

first means for deflecting said light beam onto a first plane which is sectioned parallel to said first axis;

first means for refracting said light beam deflected by said first deflecting means in such a fashion that all deflected directions of said light beam passed through said first refracting means become parallel to one another;

second means for deflecting said light beam refracted by said first refracting means, on a second plane which is sectioned parallel to said second axis, the positional relationship of said second plane with respect to said second axis, along the direction of said first axis, being determined based upon a deflection angle of each of said deflected directions of said light beam at said first deflecting means; and

second means for refracting said light beam deflected by said second deflecting means on said predetermined surface.

5,067,783

OPTICAL FIBER CONNECTOR BUILDOUT SYSTEM

Norman R. Lampert, Norcross, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 16, 1990, Ser. No. 598,497

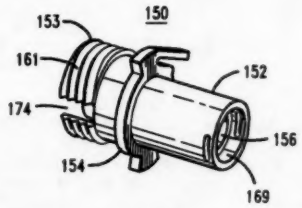
Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—60 **34 Claims**

16. A buildout system for connecting optical fibers terminated by plugs of first and second optical fiber plug assemblies, said buildout system including:

a buildout block which is adapted to be mounted in an opening in a panel and adapted to have a plug assembly connected thereto, said buildout block including a tubular portion having a longitudinally extending keyway formed in a wall thereof and extending from a flanged end which includes track and latching means, said buildout block including first and second cavities which communicate with each other through an opening in an internally disposed wall with said first cavity opening to the flanged end of said buildout block and said second cavity opening to an opposite end of said buildout block;

a buildout which includes first and second coaxially aligned tubular portions which extend in opposite directions from a flanged portion which includes securing means adapted to cooperate with said track and latching means of said buildout block to secure said buildout to said buildout block upon suitable relative rotary motion which is caused to occur between said buildout and said buildout block, said first tubular portion adapted to be received in said first cavity of said buildout block and said second tubular



portion including securing means for causing a plug assembly which is assembled thereto to be secured against unintentional rotary motion; and

a sleeve which is disposed in said first tubular portion of said buildout and which is adapted to receive in one end thereof an end portion of a plug of a plug assembly which becomes disposed in said tubular portion of said buildout block and in an opposite end thereof another plug which becomes disposed in said second tubular portion of said buildout to cause an optical connection to be made between optical fibers terminated by the plugs, said sleeve including a longitudinally extending slot in a wall thereof and said longitudinal keyway of said buildout block and said securing means of said buildout cooperating with portions of said plug assemblies assembled thereto to prevent unintended rotary motion of said plug assemblies.

5,067,784

CONNECTOR HOLDERS

George Debortoli, 257 Marilyn Avenue, Ottawa, Ontario, Canada K1V 7E4 , and Helmut H. Lukas, 95 Lake Avenue West, Carleton Place, Ontario, Canada K7C 1L7

Filed Nov. 19, 1990, Ser. No. 610,894

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—53 **5 Claims**

1. A planar connector holder for connecting a plurality of incoming optical fibers to outgoing optical fibers, the holder having:

a front end region and a rear end region;

a storage facility for the storage of a plurality of coiled lengths of fiber with the coils in the planes of the holder;

a mounting region for a plurality of optical connectors, the

mounting region disposed at the front end region of the holder with the storage facility disposed between the mounting region and the rear end region of the holder with the mounting region comprising a plurality of connector mounting positions disposed in a series which extends from mounting position to mounting position along the front end region of the holder for location of connectors in the mounting positions with an end of each connector facing forwardly from the front end region of the holder;

a connector guard provided to shield the forward facing end of each connector while being disposed forwardly in front of the mounting region to provide a space between the guard and the mounting region for other optical fibers to extend to the forward facing ends of the connectors, an inlet at one side of the holder and forwardly of the mounting region for passage of said other optical fibers into said space;

and means for limiting the minimum bend radius of said other optical fibers as they extend in the space from the forward facing ends of the connectors and laterally of the holder through the inlet.

5,067,785

ELECTRONIC MODULES

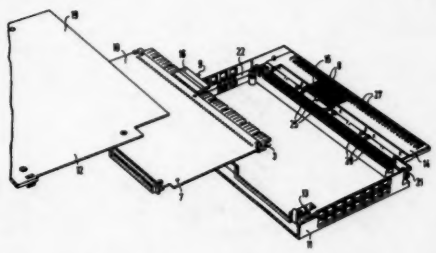
Reinhard Schirbl, Schwandorf; Günther Deinhardt, and Hermann Kasowski, both of Amberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 21, 1990, Ser. No. 586,568

Claims priority, application European Pat. Off., Sep. 25, 1989, 89117654

Int. Cl.[5] G02B *6/00*

U.S. Cl. 385—38 **20 Claims**



1. A module comprising:

a front fin;

a printed circuit board having connecting terminals;

a status display disposed on a front side of a front-sided fin, said status display comprising:

a plurality of light emitting elements; and

a plurality of fiber optic guides which lead into the fin, said fiber optic guides serving as extension elements of said plurality of light-emitting elements to display status;

a front panel connector including a cable channel receiving cables which are able to electrically connected to leads on the printed circuit board via the connecting terminals; and

a front door attached to said front panel connector.

5,067,786

OPTICAL FIBRE MONITORING

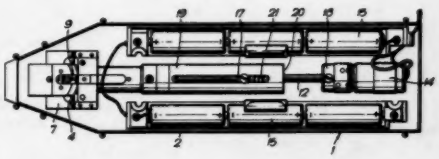
Ronald G. Hawkins, Harlow, and Richard Grigsby, Chester, both of England, assignors to BICC Public Limited Company, London, England

Filed Dec. 5, 1990, Ser. No. 623,201

Claims priority, application United Kingdom, Dec. 21, 1989, 8928825

Int. Cl.[5] G02B *6/26*

U.S. Cl. 385—13 **10 Claims**



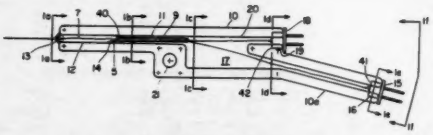
1. A handtool for detecting whether or not an optical fibre is carrying a light signal, which handtool comprises a housing of such a shape and size that it can be held in the hand; first bending means for subjecting a first portion of an optical fibre to microbending of a gradually increasing extent, which first bending means comprises an anvil fixedly secured in the housing, a pressure member so mounted in the housing that the pressure member is constrained to move towards or away from a face of the anvil in a rectilinear direction substantially normal to said face, at least one of said face of the anvil and a pressure-imparting face of the pressure member including at least one undulation, and a motor-driven operating mechanism mounted in the housing for causing the pressure member to move towards or away from the anvil so that when said first portion of an optical fibre is positioned between the pressure member and the anvil and the pressure member is caused to move towards the anvil said first portion of the optical fibre will be constrained between the anvil and the pressure member and will be subjected to microbending of a gradually increasing extent; second bending means which is fixedly secured in the housing adjacent the anvil and which will cause a second portion of said optical fibre to be subjected to macrobending to a predetermined fixed extent; first detecting means for detecting light escaping from the fibre, the first detecting means being mounted in the housing in the vicinity of the second bending means second detecting means mounted in the housing for detecting when said first portion of the fibre has been subjected to a predetermined amount of microbending; and, operatively coupled to the first and second detecting means and to the motor driving the operating mechanism of the first bending means, a control unit which will give a first output indication on receipt of a signal from the first detecting means, the arrangement being such that, on receipt of a signal from the first detecting means, the control unit will stop the motor causing said movement of the pressure member towards the anvil to prevent further increase of the extent of microbending of said first portion of the fibre and that, if the second detecting means detects that said first portion of the fibre has been subjected to its predetermined maximum amount of microbending and no signal has been received from the first detecting means, a signal is sent to the control unit which will stop the motor causing said movement of the pressure member towards the anvil to prevent further increase in the extent of microbending of said first portion of the fibre and will give a second output indication.

5,067,787

ELECTRO-OPTICAL CONVERTER

Frederick J. Gillham, Westborough, and David W. Stowe, Medford, both of Mass., assignors to Aster Corporation, Milford, Mass.

PCT No. PCT/US88/01705, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09517, PCT Pub. Date Dec. 1, 1988
PCT Filed May 23, 1988, Ser. No. 342,448
Int. Cl.[5] G02B 6/28
U.S. Cl. 385—50 8 Claims



1. An electro-optical converter including a source of optical energy and an element for detecting optical energy, comprising a supporting body which includes:

a first section adapted to support the source of optical energy and to dissipate heat generated by the source of optical energy, and

a second section adapted to support the element for detecting optical energy and to insulate the element from the heat generated by the source of optical energy,

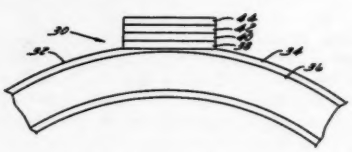
wherein said second section comprises a fiber optic coupler disposed in said second section, said fiber optic coupler comprising a pair of optical fibers juxtaposed along a length-wise continuous portion of their length in a manner to provide lateral transfer of optical energy therebetween, an end of one of the pair of optical fibers comprising a termination for said coupler, said terminating end having a length extending greater than ¼ inch from the juxtaposed portion of said coupler and being disposed along a bend, with respect to said juxtaposed portion of said coupler, selected to introduce substantial attenuation to optical energy propagating in said terminating end.

5,067,788

HIGH MODULATION RATE OPTICAL PLASMON WAVEGUIDE MODULATOR

Tomasz P. Jannson; Joanna L. Jannson, both of Torrance, and Behzad Moslehi, Redondo Beach, all of Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Filed Mar. 21, 1990, Ser. No. 496,799
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—2 12 Claims



4. A light modulator comprising

an optical fiber for carrying a guided light wave, a portion of which is not clad;

a phase-matching layer disposed on the unclad portion of the fiber;

a material, the index of refraction of which can be varied by electromagnetic energy, sandwiched between two metal electrodes to which a varying electromagnetic field is applied, the sandwich disposed on the layer and within the evanescent field of the light wave.

5,067,789

FIBER OPTIC COUPLING FILTER AND AMPLIFIER

Douglas W. Hall, Corning, and Robert M. Hawk, Bath, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Feb. 14, 1991, Ser. No. 655,726
Int. Cl.[5] G02B 6/26, 6/42
U.S. Cl. 385—27 30 Claims

1. A fiber optic filter structure comprising an optical fiber having a single-mode core surrounded by cladding material, and at least one light-attenuating light path in said cladding material uniformly spaced from said single-mode core, the propagation constants of said single-mode core and said light-attenuating light path being different at wavelengths except for at least one wavelength λ_f, the spacing between said single-mode core and said at least one light-attenuating light path being sufficiently small that light within a first band of wavelengths centered around λ_f couples between said single-mode core and said light-attenuating light path, at least a portion of the light within said first band of wavelengths being absorbed in said light-attenuating light path.

5,067,790

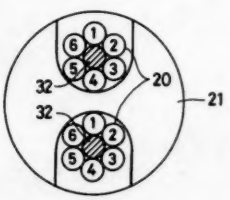
Patent Not Issued For This Number

5,067,791

FIBER IDENTIFICATION IN AN OPTICAL FIBER COMPOSITE OVERHEAD GROUND WIRE

Satoshi Nishiyama, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 11, 1987, Ser. No. 48,113
Claims priority, application Japan, May 10, 1986, 61-70558[U]
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—101 5 Claims



1. An optical fiber composite overhead ground wire, comprising:

two or more optical fiber units bundled together; and

a plurality of ground wires provided externally to said units, each of said optical fiber units comprising:

a tension member; and

a plurality of optical fibers wound on said tension member;

wherein each of said tension members is uniquely identifiable for identifying said each tension member from any other of said plurality of tension members, and each of said optical fibers within said optical fiber unit is uniquely identifiable for identifying said each optical fiber from any other of said plurality of optical fibers within said optical fiber unit.

5,067,792

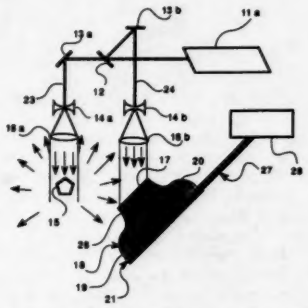
METHOD AND APPARATUS FOR INTERFACING OF HOLOGRAPHIC AND ELECTRONIC DATA

O. H. Perry Lloyd, 310 B San Jose Ave., Capitola, Calif. 95010

Filed Sep. 18, 1990, Ser. No. 584,524

Int. Cl.[5] G02B *6/04;* G03H *1/22*

U.S. Cl. 359—32 19 Claims



1. An apparatus for interfacing electronic and holographic data, comprising:

holographic generating means for generating a wavefront interference fringe,

transmission means for light guiding to which said wavefront interference fringe is directed,

sensing means and switching means for sensing, translating, and controlling the condition of said transmission means.

5,067,793

POLARIZATION-MAINTAINING SINGLE-MODE OPTICAL FIBRE AND METHOD OF MAKING SAME

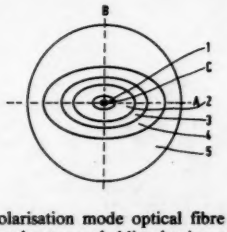
Peter K. Bachmann, Aachen, Fed. Rep. of Germany; Giok D. Khoe, Eindhoven, Netherlands; Cathal J. Mahon, Copenhagen, Denmark, and Hans-Jürgen Lydtin, Stolberg, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Aug. 10, 1990, Ser. No. 565,824

Claims priority, application Netherlands, Aug. 16, 1989, 8902073

Int. Cl.[5] G02B *6/22;* C03C *25/02*

U.S. Cl. 385—127 4 Claims



1. A single-polarisation mode optical fibre comprising at least a core and at least one cladding having a smaller refractive index than the core, characterized in that the fibre comprises at least four claddings which surround the core and which, viewed from the core outwards, have alternately a smaller refractive index than the core and a larger refractive index than the adjoining claddings, yet smaller than that of the core, and in that the dimension of at least the light-transmitting part of the fibre in a first direction perpendicular to the axis of the fibre differs from the dimension of the light-transmitting part in a second direction perpendicular to the axis of the fibre and the first direction.

3. A method of manufacturing a single polarisation mode optical fibre characterized in that in a first step a solid preform for a fibre, comprising a core and at least four claddings is manufactured in a customary manner by successively depositing cladding material and core material on the inside of a tube of quartz glass having a circular internal cross-section, and subsequently collapsing the assembly into a solid preform, after which said preform is provided with two mutually parallel faces which extend parallel and symmetrically to the axis of the tube, after which in a next step the preform is drawn into a fibre.

5,067,794

IR-PANCRATIC OPTICAL DEVICE

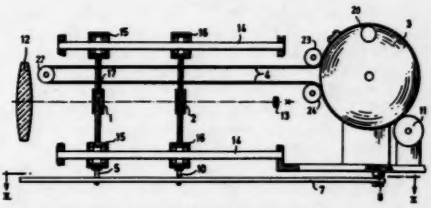
Dieter Marx, Aalen-Waldhausen, and Axel Kampf, Königsbronn, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 550,900

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1989, 3924269

Int. Cl.[5] G02B *7/02*

U.S. Cl. 359—824 6 Claims



1. An IR-pancratic optical device comprising:

a forward optical member;

a rearward optical member mounted rearward of said forward optical member and defining an optical axis therewith;

first and second intermediate optical members disposed along said axis between said forward and rearward optical members;

rotation means for providing a rotational movement;

conversion means for converting said rotational movement into a translatory movement and imparting said translatory movement to said first intermediate optical member for movement along said axis;

coupling means for position-dependently coupling said intermediate optical members to each other so as to cause said second intermediate optical member to undergo a predetermined movement in response to a linear movement of said first intermediate optical member along said axis;

a holding structure;

said rotation means including a drum rotatably mounted on said holding structure and defining an outer periphery;

said conversion means including: a band attached to said outer periphery so as to permit a first portion of said band to move in a rotational direction; redirecting means for directing a second portion of said band to move in a linear direction; and,

said first intermediate optical member being attached to said second portion of said band.

5,067,795

ADJUSTABLE TRANSPARENCY SPECTACLES

Daniele Senatore, Rome, Italy, assignor to Gianni Bulgari S.p.A., Rome, Italy

PCT No. PCT/IT87/00024, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO87/06018, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 23, 1987, Ser. No. 305,988

Claims priority, application Italy, Mar. 24, 1986, 47809 A/86

Int. Cl.[5] G02F *1/13;* G02C *00/00*

U.S. Cl. 359—84 17 Claims

1. Eyewear having adjustable transparency comprising:

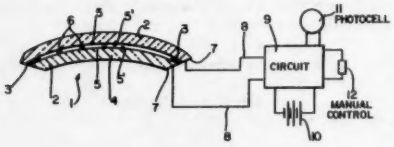
at least one lens comprising means for varying the transpar-

ency thereof in response to a variation of voltage applied thereto,

means for supplying said variable voltage connected to said transparency varying means,

means for varying said variable voltage from said voltage supplying means applied to said transparency varying means,

said means for varying the transparency of said lens comprising a liquid crystal cell including a pair of spaced transparent supports each having a transparent electrode to which said variable voltage from said voltage supplying means is



applied to produce an electric field having a variable strength, a cholesteric-nematic phase change dichroic liquid crystal between said supports which transmits light in the absence of said electric field and which absorbs light in relation to the strength of said electric field, said liquid crystal having a double refraction lower than 0.12 and a negative dielectric anisotropy, at least one of said cell supports including means for imposing on the molecules of said liquid crystal a substantially vertical alignment, said liquid crystal having a spontaneous pitch value which is equal to 0.9–4 times the thickness of said cell.

5,067,796

LIQUID CRYSTAL DISPLAY DEVICE WITH CUT-OUT PORTIONS IN LEAD ELECTRODES FOR CONNECTION TO DRIVING CIRCUIT

Takumi Suzuki, Machida, and Kiyohiro Uehara, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

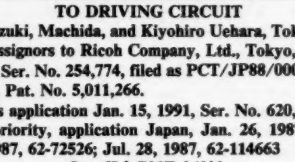
Division of Ser. No. 254,774, filed as PCT/JP88/00058 on Jan. 26, 1988, Pat. No. 5,011,266.

This application Jan. 15, 1991, Ser. No. 620,094

Claims priority, application Japan, Jan. 26, 1987, 62-9656; May 14, 1987, 62-72526; Jul. 28, 1987, 62-114663

Int. Cl.[5] G02F *1/133*

U.S. Cl. 359—88 **4 Claims**



1. A liquid crystal display device comprising:

two sheets of polymer film substrates being kept apart from each other;

two of transparent electrodes laminated respectively with inside surfaces of said respective polymer film substrates, said inside surfaces facing to each other;

a seal material inserted between said two transparent electrodes so as to form a display area in a space defined by said seal material and said two transparent electrodes, said display area being sealed with liquid crystal;

two of electrode lead-out portions extending respectively from edge portions of said respective polymer film substrates together with said transparent electrodes in one direction outwardly from said display area;

an external circuit substrate inserted between said two extended transparent electrodes at said two electrode lead-out portions; and

at least one cut-out portion formed on at least one of said two electrode lead-out portions so as to expose one portion of said external circuit substrate inserted between said two transparent electrodes, said exposed portion of said external circuit substrate being electrically connected to an external driving circuit.

5,067,797

LIQUID CRYSTAL DISPLAY CELL AND PROCESS FOR PRODUCING THE SAME

Hisao Yokokura, Hitachi; Tadao Nakada; Teruo Kitamura, both of Katsuta; Akio Mukoh, Mito; Yasuhiko Kando, Mobara; Isoji Sakai, Kobe; Yasuo Fujimura; Noboru Masutani, both of Ashiya; Tsunetaka Matsumoto, Kobe, and Yasuo Imanishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Nitto Denko Corporation, Osaka, both of, Japan

Filed Mar. 21, 1989, Ser. No. 326,557

Claims priority, application Japan, Mar. 25, 1988, 63-69276; Aug. 26, 1988, 63-210752; Oct. 6, 1988, 63-253394

Int. Cl.[5] G02F *1/133*

U.S. Cl. 359—76 **14 Claims**

1. A liquid crystal display cell comprising two spaced substrates having transparent electrodes arranged thereon in desired display patterns, a liquid crystal composition being sealed between the inner surfaces of said two substrates by a sealant, and two orientation films being arranged on individual transparent electrodes, at least one of said orientation films having an infrared dichroic ratio of 1.05 or more and a single layer film thickness of 0.003 μm or more and being obtained by spreading a solution of an organic polymer on a water surface and picking up a produced film.

5,067,798

LASER BEAM SCANNING SYSTEM

Masayuki Tomoyasu, Nirasaki, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 316,140

Claims priority, application Japan, Feb. 29, 1988, 63-44612

Int. Cl.[5] G02F *1/11, 1/33;* G01R *1/00*

U.S. Cl. 359—286 **9 Claims**

1. A laser beam scanning system comprising:

a laser beam source for emitting a laser beam;

an optical means located along an optical path for a laser beam to be conducted to a surface of a sample;

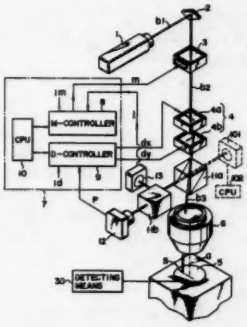
acousto-optic modulating means provided on the optical path to allow the laser beam to be continuously intensity-modulated in accordance with an input signal;

laser beam intensity control means for measuring an intensity distribution of the laser beam incident onto the sample

surface, for making uniform a laser beam illumination distribution on the surface of the sample;

laser beam deflecting means provided on the optical path to allow the laser beam to be deflected in accordance with an input signal;

position detecting means for detecting a position of the laser beam incident on the sample surface and for delivering a beam illumination position information signal;



deviation detecting means coupled to said position detecting means be detecting any deviation in the scan of said laser beam from a predetermined position and the actual beam illumination position and

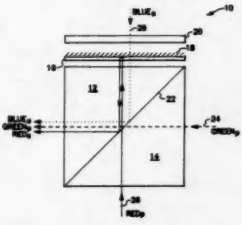
laser beam deflecting control means coupled to said laser beam deflecting means for correcting, in response to said deviation detecting means, the signal provided to the laser beam deflecting means, such that the projected spot of said laser beam scans at a predetermined position.

5,067,799

BEAM COMBINING/SPLITTER CUBE PRISM FOR COLOR POLARIZATION

Ronald S. Gold, Scottsdale, and Karen E. Jachimowicz, Goodyear, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1989, Ser. No. 457,665
Int. Cl.[5] G02B *27/10, 27/28*
U.S. Cl. 359—490 **9 Claims**



1. A color polarization cube prism for combining/splitting light, comprising:

a cube, composed of an essentially transparent material, having first, second, third, four, fifth and sixth sides, and having first and second halves of said cube juxtaposed at a plane, wherein the first and second halves have boundaries on the third and fourth sides;

a first optical coating situated between the first and second halves;

a first wave retarder proximate to the third side;

a second wave retarder proximate to said first wave retarder; and

a second optical coating situated between said first and second wave retarders; and

wherein:

said first optical coating transmits light having a first polarization and reflects light having a second polarization;

said second optical coating is a dichroic filter;

said first wave retarder is a quarter-wave plate;

said second wave retarder is a three-quarter-wave plate;

a first light, having a first polarization, enters the first side of said cube, passes through said first optical coating, and exits said cube at the second side;

a second light, having a second polarization, passes through said second wave retarder, said second optical coating and said first wave retarder, enters the fifth side of said cube, impinges the first optical coating and is reflected out of said cube through the second side; and

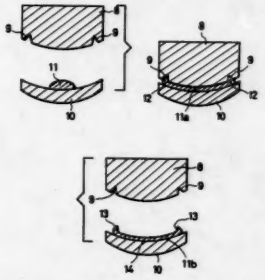
a third light, having a first polarization, enters the sixth side of said cube, passes through the first optical coating, exits said cube at the fifth side, passes through said first retarder, impinges said second optical coating and said third light is reflected by said second optical coating back through said first retarder and said third light, having its polarization changed to the second polarization, passes through the fifth side into said cube, impinges said first optical coating and said third light is reflected out of said cube through the second side.

5,067,800

COMPOSITE OPTICAL ARTICLE AND METHOD OF MANUFACTURE THEREOF

Masaki Shirakawa, Kokubunji, Japan, assignor to Olympus Optical Company Limited, Japan

Filed Jun. 11, 1990, Ser. No. 535,824
Claims priority, application Japan, Jun. 12, 1989, 1-148947
Int. Cl.[5] B29D *11/00*
U.S. Cl. 359—642 **18 Claims**



1. A composite optical article comprising; a lens base member formed of an optical glass or an optical plastic material and a plastic layer, wherein said plastic layer has an outer diameter smaller than that of said lens base member to expose an optical surface of said lens base member and said plastic layer has a projection extending from an outer peripheral edge thereof.

5,067,801

TRANSVERSE FLOW AERODYNAMIC LENS

Harold Mirels, Rolling Hills Estates; Donald J. Spencer, and Robert Hofland, Jr., both of Torrance, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

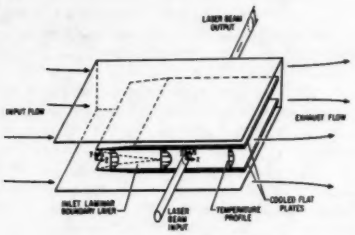
Filed Mar. 3, 1989, Ser. No. 318,582
Int. Cl.[5] G02B *3/14*
U.S. Cl. 359—666 **3 Claims**

1. A method for producing a gas lens for a high intensity laser beam:

a. flowing a temperature controlled non-absorbing gas between two parallel plates;

b. establishing the temperature of the plates so as to generate at a downstream location in the gas a uniform, parabolic gas-density and refractive index profile within a fully developed thermal boundary layer;

c. propagating a laser beam within the boundary layer of the plates in a direction transverse to the direction of the flow of the gas at said downstream location;



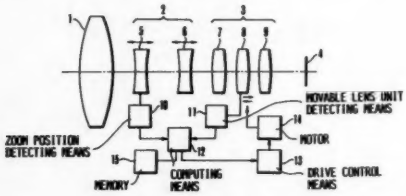
d. adjusting the temperature of the plates, wherein heating the plates to a temperature greater than the gas flow temperature focuses the laser beam and cooling the plates diverges the laser beam, thereby diverging, focusing or collimating the laser beam;

5,067,802

LENS MOVEMENT CONTROL DEVICE FOR ZOOM LENS

Kanjyo Orino, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 598,438
Claims priority, application Japan, Oct. 27, 1989, 1-281175
Int. Cl.[5] G02B *15/00*
U.S. Cl. 359—700 **8 Claims**



1. A lens movement control device for a zoom lens having variable focal lengths, comprising:

photographic lens means having first and second lens units axially movable for zooming, and a relay lens unit having a plurality of lens components to form an image with a light beam coming from said first and second lens units;

drive means for axially moving at least one lens component of said plurality of lens components;

first detecting means for detecting a focal length;

second detecting means for detecting the position of said at least one lens component;

memory means for memorizing information about the movement of said at least one lens component for each focal length; and

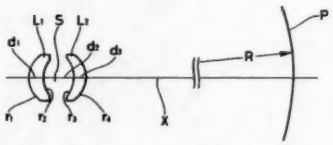
control means for controlling said drive means on the basis of information memorized by said memory means corresponding to the focal length detected by said first detecting means and information about the position detected by said second detecting means.

5,067,803

PHOTOGRAPHIC WIDE ANGLE LENS

Kazunori Ohno, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 26, 1991, Ser. No. 674,889
Int. Cl.[5] G02B *9/08, 13/18*
U.S. Cl. 359—708 **11 Claims**



1. A photographic wide angle lens comprising, from the object side thereof, a first lens of positive meniscus having a convex surface on the object side, and a second lens of positive meniscus having a concave surface on the object side, said first and second lenses having an aspheric surface at least on one of the four lens surfaces thereof and satisfying the condition of

$$0.85 < fF/fR < 1.15$$

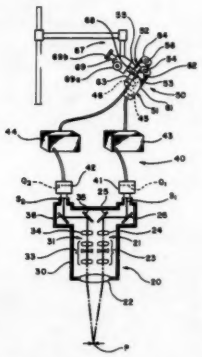
where fF and fR are focal lengths of said first and second lenses, respectively.

5,067,804

MICROSCOPE

Nobuaki Kitajima, and Kazutoshi Takagi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Jul. 5, 1990, Ser. No. 549,181
Claims priority, application Japan, Jul. 6, 1989, 1-175299
Int. Cl.[5] G02B *21/00, 21/36*
U.S. Cl. 359—369 **9 Claims**



5. A microscope for observing an object, comprising:

an objective lens-barrel including:

a first objective optical system for forming a first image of said object,

a second objective optical system for forming a second image of the object,

a first means having a light-receiving surface, coupled to said first objective optical system, for monitoring said first image, and

a second means having a light-receiving surface, coupled to said second objective optical system, for monitoring said second image; and

one or more eyepiece-barrels, detached from said objective lens-barrel and movable independently thereof, said eyepiece-barrels including:

a first means, coupled to a respective one of said first and second monitoring means, for displaying an image representing a respective one of monitored first and second images of the object,

a second means, coupled to a respective on of said first and second monitoring means, for displaying an image representing a respective one of monitored first and second images of the object,

a first ocular optical system, coupled to said first displaying means, for projecting a displayed image for observation by the user of said microscope, and

a second ocular optical system, coupled to said second displaying means, for projecting a displayed image for observation by the user of said microscope.

5,067,805

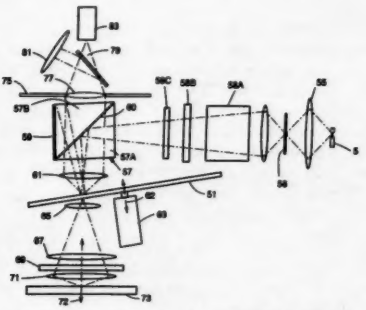
CONFOCAL SCANNING OPTICAL MICROSCOPE

Timothy R. Corle, Palo Alto; Chester L. Mallory, Campbell, and Philip D. Wasserman, Cupertino, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Filed Feb. 27, 1990, Ser. No. 485,596

Int. Cl.[5] G02B *26/02, 5/04, 21/06*

U.S. Cl. 359—235 **22 Claims**



1. A microscope for imaging a sample, including:

a polarization rotating element positioned adjacent the sample;

a rotatably mounted disk, perforated with an array of holes;

a polarizing beamsplitting cube including a partially reflective film having a normal axis, wherein the cube is positioned to receive a beam of light from a source and divert a first portion of the beam having a first polarization through the disk to the polarization rotating element; and

an image receiving means positioned to receive a second portion of the first portion of the beam, wherein said second portion has propagated through the polarization rotating element and reflected from the sample to the image receiving means back through the polarization rotating element, the disk, and the cube, wherein the cube is mounted within the microscope in such an orientation about the normal axis that the beam is incident at the cube at a nonzero incidence angle, and wherein the nonzero incidence angle is sufficiently large that reflections of the beam from outer surfaces of the cube will not interfere with the second portion.

5,067,806

QUICK SCREENING FOR SCOTOPIC SENSITIVITY SYNDROME

Alan Kwasman, 2844 Taurus, Riverside, Calif. 92503, assignor to Alan Kwasman, Riverside, Calif.

Filed Jul. 7, 1989, Ser. No. 376,553

Int. Cl.[5] A61B *3/02*

U.S. Cl. 351—233 **4 Claims**

1. A device for determining scotopic sensitivity syndrome consisting of seven cards with a visual test pattern, six of the cards are covered with different colored filters corresponding to frequencies which excite one or two of the color receptors of the eye (cones) at the same time, and one of said cards

having no filter; wherein the examiner may determine if a patient has scotopic sensitivity syndrome.

5,067,807

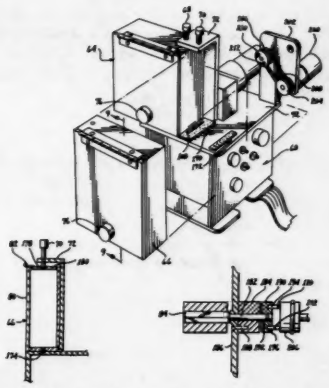
REMOVABLE FILM BOXES FOR A CAMERA

Stanislav Maron, 7801 N. 54th St., Paradise Valley, Ariz. 85253

Division of Ser. No. 260,450, Oct. 20, 1988. This application May 18, 1990, Ser. No. 525,460

Int. Cl.[5] G03B *23/02*

U.S. Cl. 352—78 R **7 Claims**



1. A removable film box usable with a camera for housing either a film feed reel or a film take up reel, said film box comprising in combination:

a) an armature for supporting a reel within said film box;

b) a hatch for opening said film box to insert and remove a film reel;

c) a light tight slit for accommodating transport of the film exterior of said film box;

d) position keying elements cooperating with complementary elements of the camera for repetitively accurately locating said film box relative to the camera, including means for retaining said position reying elements engaged with the complementary elements; and

e) drive means for rotating said armature, said drive means including a shaft extension extending from said armature externally of said film box, a source of power, an axially disengageable transmission disposed intermediate said shaft extension and said source of power for transmitting power to rotate said shaft extension.

5,067,808

THERMAL EXPANSION COMPENSATION PENDULUM

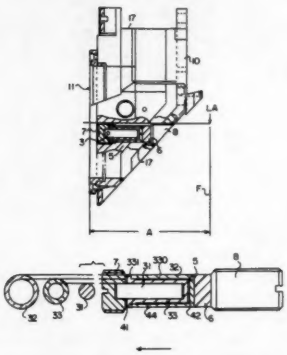
Edbert Alscher, Julius Raabstr. 18/1. A-2345, Brunn/Geb., Austria

Filed Jun. 7, 1990, Ser. No. 534,734

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1989, 3918698

Int. Cl.[5] G03B *3/00*; G02B *7/02*

U.S. Cl. 352—140 14 Claims



1. A compensating device for connecting two components of a motion picture camera comprising a mounting pin frictionally and/or positively connected with a first component of said camera, a mounting sleeve frictionally and/or positively connected with a second component of said camera, and an intermediate sleeve connected radially with said mounting pin and said mounting sleeve, with an axial gap provided between each end face of said intermediate sleeve and said first and second components.

5,067,809

OPTO-SEMICONDUCTOR DEVICE AND METHOD OF FABRICATION OF THE SAME

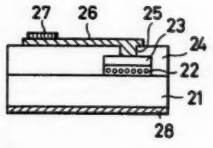
Takashi Tsubota, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1990, Ser. No. 532,458

Claims priority, application Japan, Jun. 9, 1989, 1-145209; May 8, 1990, 2-116821

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 8 Claims



1. An opto-semiconductor device comprising:
(a) a substrate and a light-emitting part located thereon;
(b) a transparent insulating monocrystalline layer located over said substrate and said light-emitting part;
(c) a contact window opened through said transparent insulating monocrystalline layer, said window being located over a portion of said light-emitting part; and
(d) an electrode comprising a transparent conductive monocrystalline layer passing through said contact window and coupled to the portion of said light-emitting part, at least a section of said electrode being located on said transparent insulating monocrystalline layer.

5,067,810

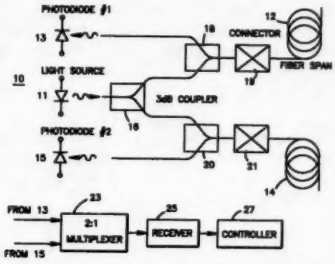
SHARED LASER TANDEM OPTICAL TIME DOMAIN REFLECTOMETER

Bu-Abbud, Plano, Tex., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Jun. 21, 1990, Ser. No. 541,577

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—73.1 32 Claims



1. An instrument for sharing N ($N \geq 2$) optical fibers comprising:
a) a single means for generating a pulse of light:
b) means for splitting said pulse of light into N pulses of light each having essentially the same power and each associated with one of said N optical fibers; and
c) means responsive to light from each of said N optical fibers for monitoring each of said N optical fibers independently of any other of said N optical fibers when each of said N light pulses are input to said associated one of said N fibers.

5,067,811

ILLUMINANCE DISTRIBUTION MEASURING SYSTEM

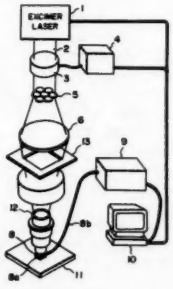
Chidane Ouchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 186,067, Apr. 25, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 542,652

Claims priority, application Japan, Apr. 28, 1987, 62-103026

Int. Cl.[5] G01J *1/00*

U.S. Cl. 356—121 32 Claims



1. An illuminance distribution measuring system for measuring an illuminance distribution on a predetermined plane irradiated by a pulsed laser beam, said measuring system comprising:
a two dimensional sensor array unit for being irradiated by the pulsed laser beam; and
determining means for determining the illuminance distribution on the plane being irradiated, said determining means comprising means for detecting the illuminance distribution on the basis of a plurality of respective output signals from said sensor array unit in response to being irradiated by a plurality of pulses of the laser beam.

5,067,812

SYSTEMS FOR INSPECTING DEFECTS IN AN OPTICAL RECORDING MEDIUM

Koichi Sugimura; Fumio Kimura, both of Tokyo, and Shigeru Izawa, Kanagawa, all of Japan, assignors to Kabushiki Kaisha CSK, Tokyo, Japan

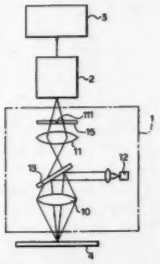
PCT No. PCT/JP89/00514, § 371 Date Jan. 23, 1990, § 102(e) Date Jan. 23, 1990, PCT Pub. No. WO89/11645, PCT Pub. Date Nov. 30, 1989

PCT Filed May 23, 1989, Ser. No. 460,091

Claims priority, application Japan, May 25, 1988, 63-128099

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—237 5 Claims



1. A defect inspecting apparatus comprising: an image forming optical system for enlarging an optical recording area of an optical recording medium having a regular pattern including a camera, an objective lens for forming an enlarged image of an optical recording area and a relay lens means for image forming an enlarged image in the camera means: an image processing portion for converting an enlarged image in said camera enlarged by said image forming optical system into an image signal and detecting a defect in said optical recording area from said image signal; and

a slotted space filter mounted on the optical axis between said camera and said relay lens in said image forming optical system for eliminating a space frequency component of said regular pattern.

5,067,813

OPTICAL APPARATUS FOR MEASURING DISPLACEMENT OF AN OBJECT

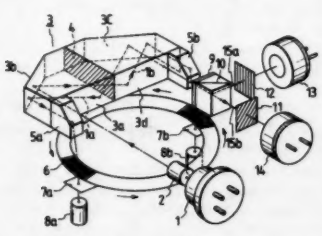
Kou Ishizuka, Urawa; Tetsuharu Nishimura, Kawasaki; Masaaki Tsukiji, and Satoshi Ishii, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,197

Claims priority, application Japan, Apr. 6, 1988, 63-84584; Apr. 6, 1988, 63-84585

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—351 18 Claims



1. An optical apparatus comprising:

an optical system for generating a linearly polarized beam having a polarization direction which changes;

a nonpolarization reflecting surface for reflecting the linearly polarized beam and for directing the reflected beam in a predetermined direction;

photoelectric converting means for photoelectrically converting a beam reflected and directed in the predetermined direction by said nonpolarization reflecting surface; and

a polarizing element, arranged in an optical path of the reflected beam, for polarizing a predetermined component of the reflected beam and for directing only one of a P-polarized beam and an S-polarized beam of the reflected beam toward said photoelectric converting means.

5,067,814

APPARATUS FOR MEASURING FINE PARTICLE IN LIQUID

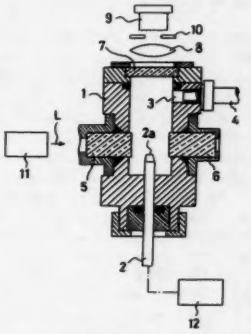
Riichiro Suzuki, Ikoma; Shigeyuki Akiyama, Ohtsu, and Yoshihiro Kubo, Takatsuki, all of Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Apr. 28, 1988, Ser. No. 187,595

Claims priority, application Japan, Jun. 13, 1987, 62-147530

Int. Cl.[5] G01N *21/53*

U.S. Cl. 356—339 7 Claims



1. In an apparatus for measuring fine particles contained in liquid, said liquid being spouted inside a housing in a first direction towards a detection system exteriorly of said housing and also having an incident light emitted in a second direction generally transverse to that of the spouted liquid and capable of being scattered by the fine particles, an improved light detection subassembly comprising:

a nozzle for spouting the liquid in the housing;

a light incident window, adjacent the nozzle, on the housing;

a light transmission window, adjacent the nozzle, on the housing;

a light source for transmitting the incident light respectively through the light incident window, adjacent the nozzle and through the light transmission window;

a detection window on the housing axially aligned in the first direction with the spouted liquid from the nozzle, and

a stop means for stopping a portion of total scattered light that could otherwise be detected by said detection system, said scattered light being produced upon said incident light interacting with said fine particles in said spouted liquid, said stop means being disposed exteriorly of said housing and including variable means for varying said portion of total scattered light.

5,067,815
OPTICAL SENSOR WITH INTERMODAL INTERFEROMETRY

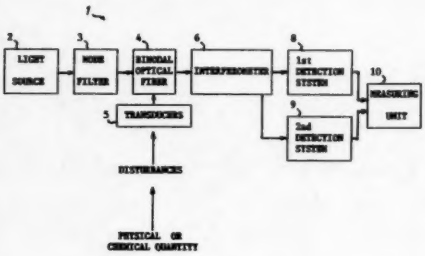
Georges Kotrotsios, Neuchatel, and Olivier Parriaux, Lausanne, both of Switzerland, assignors to Centre Suisse D'Electronique et de Microtechnique S.A., Neuchatel, Switzerland

Filed Sep. 13, 1990, Ser. No. 581,962

Claims priority, application Switzerland, Sep. 15, 1989, 03374/89

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—345 **7 Claims**



1. An optical sensor with intermodal interferometry, comprising:

optical means respectively permitting emission of a light wave, injection into a bimodal optical fiber of said light wave, and guidance of said light wave by means of said bimodal optical fiber;

means distributed along said bimodal optical fiber permitting coupling of a fundamental mode LP_{01} or of a polarization mode of said injected light wave to a first order mode LP_{11} or to an orthogonal polarization mode, respectively;

an interferometer permitting compensation of a difference in delay time between coupled modes at an input of the interferometer, by modification of conditions of interference of said interferometer; and

electrical means permitting measurement of said modification made to said interferometer, detection, in intensity, of a product of said interference, and determination of a position, along said bimodal optical fiber, of a disturbance which created the intermodal coupling.

5,067,816
OPTICAL ENCODER

Souji Ichikawa, Sahamihara, Japan, assignor to Mitutoyo Corporation, Tokyo, Japan

Continuation of Ser. No. 308,465, Feb. 10, 1989, Pat. No. 5,026,164. This application Dec. 27, 1990, Ser. No. 634,545

Claims priority, application Japan, Feb. 22, 1988, 63-22031[U]; Oct. 4, 1988, 63-130027[U]

Int. Cl.[5] G01B *11/14*; H01J *40/14*

U.S. Cl. 356—373 **9 Claims**

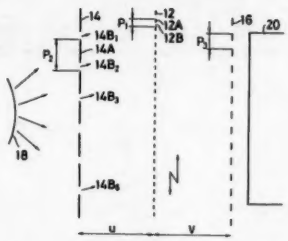
1. An optical encoder comprising:

a first scale fixed to one of two relatively movable members and formed with a first grating;

the other of the two relatively movable members including a light source for emitting an uncollimated illuminating light; a second scale formed with a second grating for partially shielding the illuminating light from the light source and illuminating the first grating; a third scale formed with a third grating for further restricting the illuminating light which has been restricted by the second and first gratings; and a light receiving element for detecting the illuminating light which has been restricted by the first and third gratings;

wherein a relative displacement between the relatively movable members is detected from a periodic variation of a detection signal from said light receiving element, and

a pitch P2 of the second grating is set at a value larger than



a pitch P1 of the first grating and a length of a light transmitting portion of the second grating is set at a value no greater than the length of the pitch P1 of the first grating and the ratio of the light shielding portion to the light transmitting portion of the second grating has an optimum range of 3:1 to 7:1 to improve a signal to noise ratio of the detection signal.

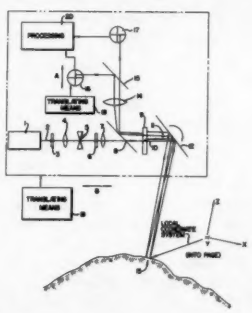
5,067,817
METHOD AND DEVICE FOR NONCONTACTING SELF-REFERENCING MEASUREMENT OF SURFACE CURVATURE AND PROFILE

Paul Glenn, Wellesley, Mass., assignor to Bauer Associates, Inc., Wellesley, Mass.

Filed Feb. 8, 1990, Ser. No. 476,701

Int. Cl.[5] G01B *11/24*

U.S. Cl. 356—376 **33 Claims**



1. An apparatus for measuring the curvature and profile of a test surface comprising:

means for producing a pair of parallel light beams;

means for directing said parallel light beams onto said test surface;

means for separating reflections from said test surface of said parallel light beams into first and second separated reflected light beams;

first and second individual position sensitive detectors; and

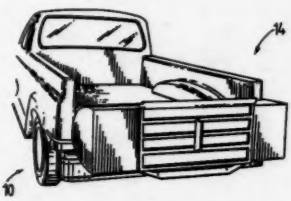
means for focusing the first and the second separated reflected light beams on to the respective position sensitive detectors to produce output signals indicating curvature of said test surface, wherein a focal point of the means for focusing resides on each of said position sensitive detectors, such that the curvature of said test surface is determined irrespective of the alignment of said test surface.

5,067,818

CEMENT MIXER SYSTEM

Kenneth J. Howe, 808 Assineboine Crescent, Sarnia, Ontario, Canada N7T 7C4

Filed Jan. 23, 1989, Ser. No. 299,434
Int. Cl.[5] B28C *7/16, 5/42*
U.S. Cl. 366—46 **7 Claims**



1. A mixer for installation in a pick-up truck, comprising:

a unitary elongate body having a longitudinal axis, an arcuate bottom surface, and an access to said body, said body divided into a mixer section and a power section;

mixing means mounted in said mixer section for rotation about said longitudinal axis;

motor means in said power section connected to said mixing means for rotation of said mixing means;

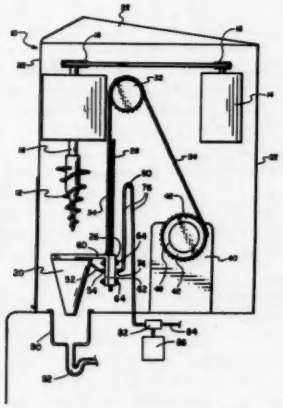
mounting means at each end of said body for pivotally mounting said body on tailgate pivots of a pick-up truck, said mounting means including pivotal supports extending from said body and positioned on a pivotal axis, said pivotal axis extending parallel to and spaced from said longitudinal axis and positioned external to said arcuate bottom surface below said longitudinal axis when said body is in an upright position; locating and retaining means on said body for releasably locating and locking said body in an upright position on said truck a release of said locating retaining means permitting pivoting of said body about said pivotal axis for discharge from said body.

5,067,819

CLEANING AND SANITIZING SYSTEM FOR FROZEN DESSERT MIXING MACHINE

Duane H. Heinhold, 412 W. 2300 South, Bountiful, Utah 84010, and Kenneth E. Heinhold, 3015 Chaucer Pl., Salt Lake City, Utah 84108

Filed May 11, 1990, Ser. No. 522,664
Int. Cl.[5] B01F *7/24;* B08B *3/02*
U.S. Cl. 366—138 **8 Claims**



1. In a frozen dessert mixing machine including a mixing auger, a motor driven system for rotating the auger, a mixing cone in coaxial alignment with the mixing auger, and drive means for moving the mixing cone in linear movement toward and away from said auger, said improvement comprising

at least one orifice in a sidewall of the mixing cone; and

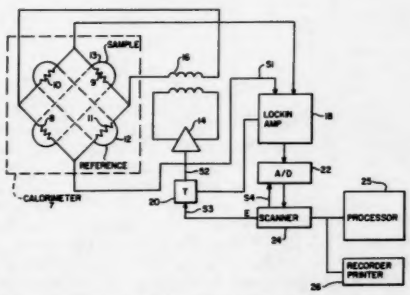
means for delivering a fluid through said orifice as the cone and the orifice are moved up and down adjacent to said auger to introduce said fluid into the interior of the mixing cone and to spray said fluid over the auger as the orifice moves along the axial dimension of the auger.

5,067,820

RADIONUCLIDE CALORIMETER SYSTEM

Thomas P. Donohoue, Denver; Christopher P. Oertel, Arvada; William H. Tyree, Boulder, and Joe L. Valdez, Denver, all of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 19, 1990, Ser. No. 540,240
Int. Cl.[5] G01K *17/08*
U.S. Cl. 374—31 **11 Claims**



1. A radionculide calorimeter system, comprising:

(a) an isothermal twin bridge calorimeter having a sample compartment and associated sample resistive elements, said sample compartment containing a radionuclide sample, and a refernce compartment and associated reference resistive elements, said resistive elements connected in a wheatstone bridge arramgenet such that the heat output from said radionuclide sample is detected by measuring the resitance changes of said sample reisstive elements, whereupon an equilibirum temperature differential represents the condition where said heat output of said radionuclide sample is equal to the heat output of the remaining thermal mass of said calorimeter;

(b) an alternating current source to provide current to said reistive elements;

(c) a lock-in amplifier connected to said resistive elements to phase lock a signal from said resistive elements with a signal from said ac current source, said lock-in amplifier providing a smooth voltage proportional to the magnetitude of said signal from said resistive elements;

(d) an analog to digital converter connected to receive said voltage and convert said voltage to a digitial signal;

(e) compurting means for storing said digital signals and for correlating said digital signasl to a decay function for prediction of said steady state temprature differential to provde data on said radionuclide sample.

5,067,821

DISPOSABLE BAG APPARATUS AND METHOD

J. Winslow Young, 803 E. Center St., Centerville, Utah 84014

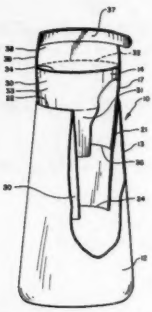
Filed Apr. 27, 1990, Ser. No. 515,106
Int. Cl.[5] B65D *30/28, 33/20*
U.S. Cl. 383—36 **4 Claims**

1. A disposable bag with an integral reflux valve and a funnel for directing liquid material through the reflux valve and into

the bag, the reflux valve restricting reverse flow of liquids from the bag comprising:

a disposable bag configured with an upwardly tapered, frustoconical configuration with an open mouth at the apex of said frustoconical configuration;

a reflux valve inside said bag, said reflux valve being formed from an upper section of said frustoconical configuration being folded inwardly into said bag at a fold, said fold defining said upper section, said reflux valve depending downwardly into said bag at said fold; and



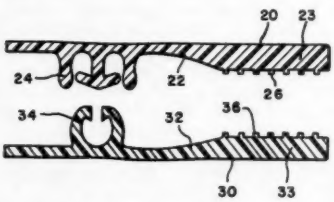
a funnel member adhesively sealed in said reflux valve at said fold, said funnel member having an open top and an open bottom and comprising a first, flexible sidewall and a second, flexible sidewall joined along adjacent side edges, said first and second sidewalls having corresponding trapezoidal profiles with a first, long length across a top of said funnel and a second, shorter length across a bottom of said funnel, said side edges converging incrementally and downwardly toward said open mouth at an acute angle corresponding to said frustoconical configuration, said funnel being openable upon squeezing said side edges together.

5,067,822

METHOD OF FORMING RECLOSEABLE PACKAGES, PROFILES USED THEREIN, AND PACKAGES PRODUCED THEREBY

Lawrence W. Wirth, Neenah; Wayne M. Wegner, Appleton; Mladomir Tomic, Appleton; Raymond Buchko, Appleton, all of Wis., and Johann Natterer, Bavaria, Fed. Rep. of Germany, assignors to Reynolds Consumer Products, Inc., Appleton, Wis.

Filed Apr. 24, 1989, Ser. No. 342,257
Int. Cl.[5] B65D *33/16*
U.S. Cl. 383—61 **23 Claims**



1. A recloseable package comprising:

a) film walls sealed to each other and to recloseable profile strips located along one side of said film walls to form the package,

b) the recloseable profile strips each comprising:

i) a flange element having a front and back side; and

ii) a recloseable means element on the front side of the flange element; and

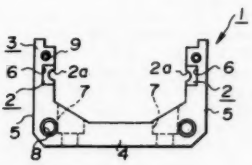
c) a heat barrier means forming a part of the recloseable profile strips and associated with the front side of at least one of the flange elements sufficient so that at least one of the film walls may be heat sealed to the respective back side of the pair of recloseable profile strips while the recloseable means elements of the profile strips are mated, without also fusing the flange elements of the recloseable profile strips in the area of the heat barrier, due to the presence of said heat barrier.

5,067,823

LINEAR GUIDE APPARATUS

Shinichi Kasuga, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1990, Ser. No. 528,128
Claims priority, application Japan, May 24, 1989, 1-130575
Int. Cl.[5] F10C *29/06*
U.S. Cl. 384—45 **2 Claims**



1. In a linear guide apparatus comprising a guide rail having a pair of axially extending ball rolling grooves, and a moving member having ball rolling grooves respectively opposing the ball rolling grooves of the guide rail and movable axially along the guide rail through the rolling of a plurality of balls interposed between the mutually opposing ball rolling grooves of the guide rail and the moving member, the improvement in which:

the guide rail includes a pair of rail members respectively having the ball rolling grooves formed therein and a rail main body to which the pair of rail members are integrally coupled, the rail main body having a U-shaped cross section and formed of a lightweight metal;

the moving member being in the form of a nut block axially movable in the U-shaped cross section of the rail main body when driven by a ball screw shaft engaged therewith;

a pair of recessed grooves respectively formed in the inner surfaces of the side walls of the rail main body in opposing relation to each other, each of the recessed grooves having a width at a bottom surface equal to the width of a bottom surface of each of the rail members;

each of the rail members having tapered surfaces formed in upper and lower surfaces thereof so that the width of each rail member is reduced from the bottom surface to an inner surface having the ball rolling groove formed therein, each of the rail members being formed of a hardened steel to provide each of the rail members with a hardness greater than the hardness of the rail main body; and

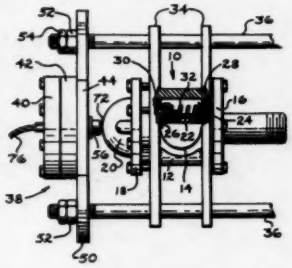
the rail main body having a pair of notches formed in each of the inner surfaces of the side walls thereof, the notches being formed by plastic deformation of the upper and lower portions of each recessed groove to bring the upper and lower inner surfaces of each recessed groove into close contact with the tapered surfaces of each of the rail members and to integrally couple each of the rail members to the rail main body.

5,067,824

AIR CONTROLLED ROTARY JOINT COMPENSATOR

John H. Peter, Three Rivers; Gerald L. Timm, Schoolcraft, and Roger D. Wiedenbeck, Three Rivers, all of Mich., assignors to The Johnson Corporation, Three Rivers, Mich.

Filed Jun. 29, 1990, Ser. No. 545,569
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—99 4 Claims



1. The method of compensating the axial loading on the bearings of a rotary joint supplying stem to a drum having an axis of rotation wherein the interior of the joint, the bearings and the drum are subjected to pressurized steam, steam being supplied to the rotary joint by a header, and the rotary joint including a bearing axial load compensating expansible chamber comprising the steps of:

(a) sensing the pressure of the steam within the header, to produce a control signal,

(b) providing a source of compressed air,

(c) controlling the pressure of said compressed air with said control signal, and

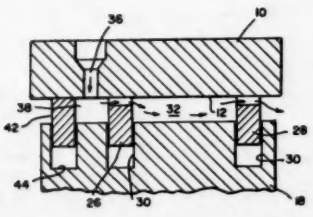
(d) introducing said controlled compressed air into the rotary joint expansible chamber to impose an axial force on the rotary joint proportional to said control signal to regulate the axial load on the rotary joint bearings as determined by the pressure of the steam within the header.

5,067,825

AIRCRAFT ENGINE ROTOR SQUEEZE FILM DAMPER

John M. Vance, 2908 Chaparral, and Luis A. San Andres, 3706A Plainsman Ln., both of, Bryan, Tex. 77802

Filed Jun. 18, 1990, Ser. No. 539,490
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—99 12 Claims



1. In an aircraft engine rotor system including

an enclosure having an inner encircling wall surface, and

a rolling-element bearing assembly disposed in said enclosure, said rolling-element bearing assembly receiving an aircraft rotor shaft therein, said rolling-element bearing assembly along with said rotor shaft orbitally translating within said enclosure when said rotor shaft is rotating, said enclosure having an oil inlet therein for admitting an oil flow interiorly of said enclosure for establishment of a squeeze film intervening said rolling-element bearing assembly and the enclosure inner surface, squeeze film damper feed and seal mechanism comprising

a pair of rings engaged with the inner wall surface of said enclosure and encircling said rolling-element bearing assembly, said rings being spaced one from the other a distance to define a squeeze film region therebetween at the outer peripheral surface of said rolling-element bearing assembly, one of said rings being located adjacent the enclosure oil inlet, and

an end seal engaged with said inner wall surface and encircling said rolling-element bearing assembly and spaced from said one ring such that the enclosure oil inlet is intermediate said one ring and said end seal, space between said one ring and said end seal defining an oil feed chamber,

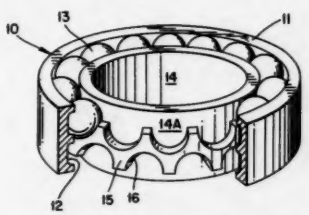
said one ring having a plurality of recesses formed at the periphery thereof for communicating an oil flow from the feed chamber into the squeeze film region, the other of said pair of rings having a plurality of recesses formed at the periphery thereof whereby oil in the squeeze film region can outflow therefrom to an oil outlet, said rolling-element bearing assembly having continuous slots extending around the periphery thereof and associated respectively with each of said rings and with said end seal for accommodating said rings and said end seal during orbiting translating movement of said rolling-element bearing assembly.

5,067,826

BALL AND ROLLER BEARINGS AND BEARING COMPONENTS

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 32,352, Mar. 31, 1987, Pat. No. 4,960,643. This application Mar. 7, 1990, Ser. No. 489,664
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] F16C *33/32, 33/34*
U.S. Cl. 384—492 7 Claims



1. A roller for use in roller bearings, said roller comprising:

a) a shaped roller substrate formed of a hard material and having a longitudinal outer surface of revolution,

b) said surface of revolution of said roller being entirely coated with means defining a hard synthetic diamond-like material deposited in situ thereon in a thickness sufficient to protect said surface from frictional wear during the operation of said roller,

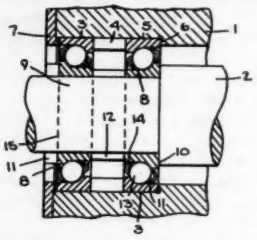
c) said synthetic diamond-like material is deposited on said substrate to a thickness sufficient to protect the surface stratum of said roller from developing surface occlusions such as surface cracks and from the spread of surface defects due to impact loads applied to said roller during the operation of the roller bearing in which said roller is used.

5,067,827

MACHINE BEARING ARRANGEMENT WITH FORM-MEMORY DEFORMABLE ELEMENT

Arnold Bokel, Schwebheim, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 232,292, Aug. 15, 1988, abandoned.
This application Mar. 6, 1990, Ser. No. 492,423
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727151
Int. Cl.[5] F16C *35/06*
U.S. Cl. 384—537 11 Claims



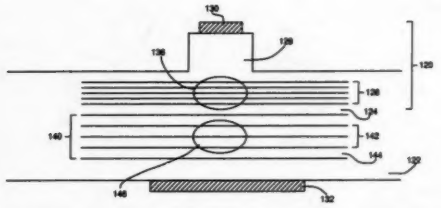
1. A machine bearing arrangement for supporting a rotating machine member having an axis in or on a stationary machine member, said machine bearing arrangement comprising at least one bearing ring forming a raceway for rolling elements, and means for axially locking said at least one bearing ring to one of the rotating and stationary machine members, said axially locking means comprising a deformable element constituted of a form-memory alloy having a one-way characteristic.

5,067,828

TRANSFERRED ELECTRON EFFECTIVE MASS MODULATOR

Gerard J. Sullivan, Thousand Oaks; Kenneth D. Pedrotti, Moorpark, and Herbert Kroemer, Santa Barbara, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 9, 1990, Ser. No. 565,292
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—3 18 Claims



1. An optical radiation modulator having a waveguide region with an alterable index of refraction over a predefined range disposed adjacent to lower refractive index cladding, the waveguide region comprising:

a first doped region of a semiconductor material having a first effective mass for free charge carriers at a predefined band edge energy, said first region being doped to provide at least one conduction band with a first minimum band edge energy;

a second doped region of said semiconductor material positioned immediately adjacent to said first doped region and having a second effective mass for said free charge carriers at said predefined band edge energy, said second region being doped at a different concentration from said first doped region so as to have at least a second conduction band with a minimum band edge energy substantially the same as said first minimum band edge energy;

third and fourth regions of barrier material disposed adjacent said first and second regions, respectively, so as to restrict transfer of free carriers outside of said first and second doped regions; and

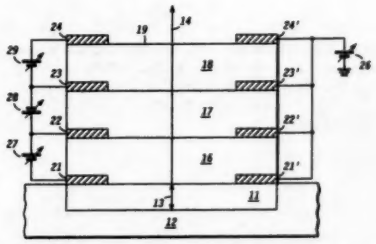
means for moving charge carriers between said first and second regions.

5,067,829

DYNAMIC OPTICAL BEAM STEERING

James E. Jaskie, Scottsdale; Michael S. Lebby, Chandler, and Fred V. Richard, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 10, 1990, Ser. No. 579,513
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—8 18 Claims



1. A dynamic optical beam steering means, comprising:

a light source which emits a beam of light in a predetermined path;

at least one optically transparent layer of elastic material, having a bottom surface and a top surface, the at least one optically transparent layer being placed in the path of the beam of light;

at least one first electrode attached to at least a portion of the bottom surface of the at least one optically transparent layer; and

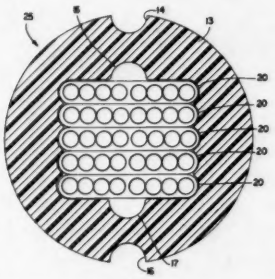
at least one second electrode attached to at least a portion of the top surface of the at least one optically transparent layer, the at least one second electrode being substantially aligned with the at least one first electrode, such that when a voltage is applied to the at least one first and at least one second electrodes, the layer of elastic material will deform.

5,067,830

INDENTED TUBE FOR OPTICAL RIBBON

Warren W. McAlpine, and Dieter Kundis, both of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Dec. 21, 1990, Ser. No. 632,159
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—114 10 Claims



3. An optical cable element, comprising:

(a) a tube having a first lengthwise indentation in its outer surface and a second lengthwise indentation in its inner surface adjacent to the first lengthwise indentation; and

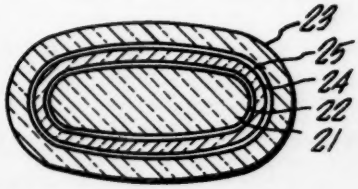
(b) an optical waveguide ribbon within the tube.

5,067,831

LINEAR OPTICAL CONDUITS

John A. Robbins, North Hollywood; Jamshid J. Zarian, Woodland Hills, and Sandford R. Willford, Newport Beach, all of Calif., assignors to Lumenyte International Corporation, Costa Mesa, Calif.

Filed Dec. 13, 1989, Ser. No. 446,011
Int. Cl.[5] G02B 6/20, 6/00
U.S. Cl. 385—123 16 Claims



1. A linear light conduit comprising:

a monofilament, light transmitting core selected from the group consisting essentially of thermoplastic and thermoset polymer surrounded by;

a fluoropolymer clad surrounded by;

a jacket made of a polymer which has been extruded over the fluoropolymer core;

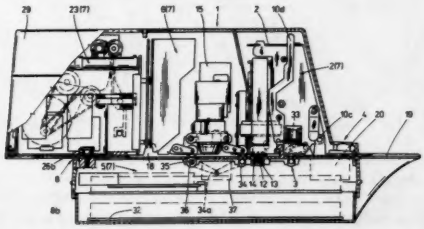
whereby said linear light conduit is capable of emitting light circumferentially, transverse to the conduit length.

5,067,832

EXPANDABLE MODULE FRAME FOR MOUNTING PRINTER AND ACCESSORY MODULES

Rupert Baur, Villingen; Egon Durler, Mönchweiler, and Hermann Kilb, Brigachtal, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 148,318, Jan. 27, 1988, abandoned. This application Apr. 26, 1990, Ser. No. 515,078
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702270
Int. Cl.[5] B41J 5/30
U.S. Cl. 400—66 24 Claims



1. A printer for a plurality of different print substrate material processing functions comprising

a base frame;

a print apparatus forming a modular building block and demountably attached to the base frame;

a print apparatus material transport device disposed on the base frame;

a keyboard attached to the base frame for inputting process information;

an electronic control device forming a modular building block and attached to the base frame and electrically connected to the print apparatus and to the keyboard;

a power supply forming a modular building block and attached to the base frame and electrically connected to the electronic control device;

attachment means for modular building blocks disposed at the base frame, wherein the modular building blocks can be mounted to and demounted from the attachment means for modular building blocks;

attachment means for mounting and demounting of a function module selectable out of at least two functionally differing function modules wherein at least two functionally differing function modules are each interface-compatible relative to said attachment means for mounting and demounting;

two function modules capable of performing at least two differing functions with each of the two function modules adapted for attachment to the attachment means;

wherein the print apparatus is provide with a print head;

the base frame is provided with sides;

the print apparatus is provided at the distance of the sides of the base frame;

side walls are provided in the distance of the sides of the base frame, which side walls are connected to each other with slide guide rods;

the print apparatus is provided with a drive block comprising an electric drive motor, a drive gear, and a cycle clock station for sending signals for a print head control, said print head being movable back and forth on said slide guide rods with an automatic print substrate material thickness compensating device and a color-tape cassette insertable between the side walls, thereby altogether forming the print apparatus modular building block.

5,067,833
RIBBON SHIFTING DEVICE FOR PRINTERS

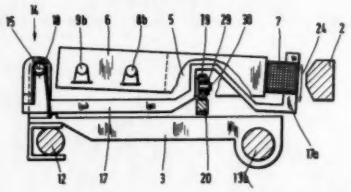
Guenter Gomoll, Nersingen/Leibi, and Wolfgang Hauslaib, Langenau, both of Fed. Rep. of Germany, assignors to Mannesmann A.G., Duesseldorf, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,419

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3607999

Int. Cl.[5] B41J *35/14*

U.S. Cl. 400—213 **6 Claims**



1. A ribbon device for a printer which includes a print head mounted on a carriage, said carriage reciprocating on rail means along and parallel to a printing platen, the platen as well as the rail means being held in opposite side walls of a printer frame or the like, there being a ribbon cartridge defining and establishing a space within which said print head can move and paying the ribbon such that the ribbon is placeable between the print head and the platen during printing, the combination comprising:

said ribbon forming a closed Moebius loop;

a ribbon holder for holding the ribbon in front of the print head and being pivotally mounted on a pivot axis on the carriage, the pivot axis extending parallel to said platen and to said direction of reciprocating movement and being situated on the carriage at an area away from the print head;

particular rail means mounted between said printer frame side walls and extending generally parallel to said platen, said pivot axis and said carriage rail means, and being located between the pivot axis and the platen, said particular rail means being contoured to have a higher elevation in a central portion than in portions more adjacent to said side walls; and

said ribbon holder being provided with low friction means riding on said particular rail means so that upon reciprocating of said carriage and passage of the print head along a platen, the ribbon holder moves up and down in one full cycle when moving from end to end.

5,067,834
INPUT KEYBOARD APPARATUS FOR INFORMATION PROCESSING DEVICE AND OTHER KEYBOARD DEVICES

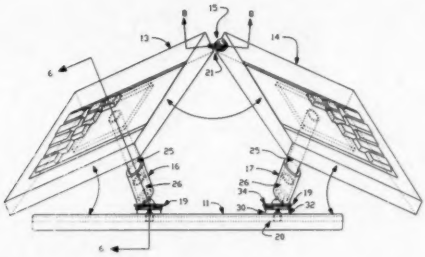
Jeffrey P. Szmanda, 728 W. St. Paul Ave., Waukesha, Wis. 53188, and William J. Szmanda, N61 W15150 Wigwam Dr., Menomonee Falls, Wis. 53051

Filed Jul. 7, 1989, Ser. No. 376,690

Int. Cl.[5] B41J *5/10*

U.S. Cl. 400—489 **13 Claims**

1. A keyboard apparatus having a plurality of keys arranged in an array extending over an extended front-to-back and side-to-side of a keyboard support for dual hand operation by an operator, comprising a key support structure for supporting of said keys, said support structure defining a left array section having a first individual support unit secured generally centrally of the section and a right array section having a second individual support unit secured generally centrally of the right array section, each of said array sections including a plurality of individual keys, each of said array sections being a substantially planar member having the keys located in a substantially common plane, each of said support units including a universal support unit for inclined location of the section and for substantially complete rotation of the section in the plane of the section, said left array section located in a laterally inclined plane and having at least portion of said keys arranged in said inclined plane and thereby extending upwardly at a preselected angle from an outer left portion of the keyboard upwardly and inwardly toward said right array section, said right array section located in a laterally inclined plane having a least a



portion of said keys located in said inclined plane extending from an outer right portion of said keyboard upwardly and inwardly toward the left array section whereby an operator operating said keyboard can operate the keys in said inclined planes with the hand located in essentially forward aligned projection from the operators arm portion to minimize bodily stress.

5,067,835
PRINTING APPARATUS

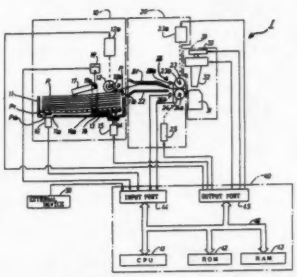
Takemi Yamamoto, Nagoya, and Shigeo Ishikawa, Aichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 30, 1990, Ser. No. 605,483

Claims priority, application Japan, Nov. 27, 1989, 1-306849

Int. Cl.[5] B41J *11/46*; G03G *21/00*; B65H *7/02*

U.S. Cl. 400—582 **20 Claims**



1. A printing apparatus comprising:

a main body;

a feed cassette detachably loaded in the main body for containing cut sheets to be printed;

at least one controllable means disposed along a feed path of a cut sheet from the feed cassette;

storing means for storing various sheet information about the cut sheets contained in the feed cassette, the storing means being detachably placed in the main body;

reading means for reading the various sheet information from the storing means when the feed cassette is loaded in the main body, the reading means being provided on the main body; and

controlling means for controlling the at least one controllable means based on the various sheet information read by

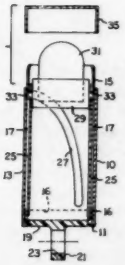
the reading means, wherein said at least one controllable means includes a feeding means for feeding a cut sheet from the feed cassette, said storing means stores at least the friction coefficient of the cut sheets, said reading means reads the friction coefficient and said controlling means controls the feeding means based on the friction coefficient read by said reading means.

5,067,836

LIPSTICK KEY CHAIN ATTACHMENT

Shahid H. Khan, 8950 Goodrich Rd. #307, Bloomington, Minn. 55437

Filed Nov. 7, 1990, Ser. No. 610,060
Int. Cl.[5] A45D *40/00, 40/06, 40/18*
U.S. Cl. 401—52 **1 Claim**



1. A lipstick dispenser comprising an axially elongated cylindrical tube having a first end and a second end, said tube comprising a cylindrical sleeve and a cylindrical liner having a friction fit within the sleeve, said liner having an axial slot extending therealong, said liner having one end thereof spaced from the corresponding end of the sleeve to form an internal circumferential groove at said first end of the tube; a circular disk located within said first end of the tube with a peripheral edge thereof rotatably seated in said circumferential groove, an external flat wall extending axially from said disk along a diametrical midplane of the disk, a hole extending transversely through said flat wall for attachment of the dispenser to a key chain; a tubular actuator affixed to said disk, said actuator extending from said disk within said cylindrical tube; a helical slot in said tubular actuator; a lipstick holder floatably arranged within said actuator; and a pin extending from said holder through said helical slot into said axial slot, whereby manual rotation of the disk relative to the cylindrical tube causes the lipstick holder to move axially between the first and second ends of the tube.

5,067,837

VARIABLE POINT WRITING INSTRUMENT

Peter J. Panopoulos, 9220 S. 87th Ct., Hickory Hills, Ill. 60457

Continuation-in-part of Ser. No. 759,297, Jul. 26, 1985, abandoned. This application Nov. 22, 1989, Ser. No. 440,318
Int. Cl.[5] B43K *8/02, 9/00*
U.S. Cl. 401—107 **3 Claims**

1. A variable tip writing instrument for printing characters of the type having a storage end and a writing tip end positioned in opposed relation to the storage end, and a barrel adapted to contain a supply of ink formed as a part of the storage end, which is in communication with the writing tip end, the improvement comprising in combination,

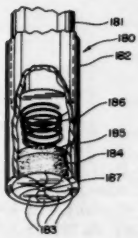
a writing tip positioned at the writing tip end of said instrument within the confines of the barrel,

said writing tip formed from an ink deliver material formed from a porous spongy membranous material,

control means associated with said porous spongy membranous material and adapted to control and vary the amount of porous spongy membranous material exposed at the writing tip end of said instrument,

said control means including a collar rotatably mounted on the barrel of said writing instrument adjacent the writing tip end thereof,

said collar provided with a plurality of shutter blades pivotly secured to said collar and adapted to open and close in response to the rotational movement of said rotatable collar.



said rotatable collar adapted for manipulation between a fully opened positioned exposing the greatest amount of porous spongy membranous material and rotatable to vary the diametric dimension of said shutter blades to a fully closed position,

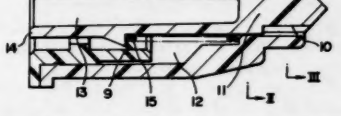
whereby the writing instrument is provided with a single writing tip capable of varying the diametric dimension thereof by said control means between a large and a small diametric dimension thereby to vary the amount of porous spongy membranous material available for imprinting characters.

5,067,838

VALVE UNIT FOR WRITING INSTRUMENTS OR LIQUID APPLICATORS

Yasuyuki Iwase, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 492,380, Mar. 12, 1990, abandoned, which is a continuation of Ser. No. 190,746, May 5, 1988, abandoned. This application Dec. 28, 1990, Ser. No. 632,670
Claims priority, application Japan, May 8, 1987, 62-69462
Int. Cl.[5] B43K *5/00, 5/18;* **A46B** *11/04*
U.S. Cl. 401—206 **2 Claims**



1. A valve unit for liquid application instruments including writing pens which comprises:

(a) a spring support provided with front and rear axial openings and having an annular projection to cooperatively serve as a virtual sealing means;

(b) an annular valve seat member affixed to said spring support and having an annular valve seat and an adjacent cylindrical portion on its inner periphery;

(c) a valve stem slidably mounted in said spring support and valve seat member with a valve body having a rearwardly facing outwardly directed skirt portion formed by a frusto-conical external surface to serve as a valve body while

in contact with said annular valve seat, the free edge of said skirt being in sealing contact with said cylindrical portion; and

(d) a coil spring interposed between said spring support and said valve stem urging said valve stem towards said valve seat.

5,067,839

STYLO PEN TIP AND AUXILIARY REMOVING TOOL

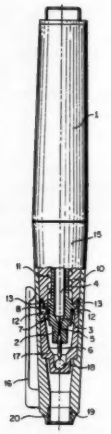
Peter Felgentreu, Hamburg, Fed. Rep. of Germany, assignor to Koh-I-Noor Inc., Hamburg, Fed. Rep. of Germany

Filed Dec. 10, 1990, Ser. No. 625,016

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3940968

Int. Cl.[5] B43K *8/16, 9/00, 13/00*

U.S. Cl. 401—258 **6 Claims**



1. A stylo pen tip which comprises a front part (2) supporting a writing tube (6),

(a) said front part (2) having a rear section that extends into a front section of a writing fluid catridge (10),

(b) said writing fluid cartridge (10) having a closure element which is to be released by said front part (2) when said front part (2) is inserted into an operating position in said writing fluid cartridge (10),

(c) said front section of said writing fluid cartridge (10) having an elastically stretchable opening cross section (12) on its front end which is narrowed with respect to the rest of the writing fluid cartridge and which, in the operating position, grips the front of a protrusion area (8) formed on said front part (2),

(d) wherein said front part (2), in said operating position, has an open area located ahead of said protrusion area (8) that is defined by an outer diameter smaller than the maximum inside diameter of said opening cross section (12),

(e) so that an auxiliary tool (19,20) can be engaged within the open area of said front part (2) and brought into a stretching contact with said stretchable opening cross section (12) of said writing fluid cartridge (10).

5,067,840

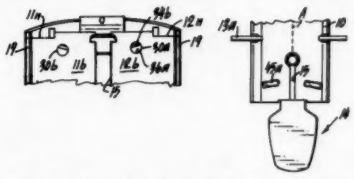
BINDER LOCKING RING MECHANISM WITH CONFIGURED TRIGGER

Edward W. Cooper, Scarborough, and Orlando R. Guerrieri, Pickering, both of Canada, assignors to Acco World Corporation, Wheeling, Ill.

Continuation of Ser. No. 348,843, May 8, 1989, abandoned. This application Nov. 5, 1990, Ser. No. 609,287

Int. Cl.[5] B42F *13/26*

U.S. Cl. 402—38 **1 Claim**



1. In a loose-leaf sheet binder lock mechanism having a case member, a pair of elongated hinge plates engageable along a centerline, ring halves mounted on the plates operable to form loose-leaf retaining rings, a trigger lever having a body portion vertically-oriented when the lever is closed and the trigger being operable to move the plates between an open ring position to a closed ring position, the improvement comprising

a pair of spaced-apart blister means oriented at an angle to the plate centerline on said case member;

spaced-apart lugs on the body portion of the trigger lever oriented at an angle to the plate centerline for positioning in and engagement with such blister means;

trigger lower projections on the body portion; and

apertures in the hinge plates for receiving and engaging the lower trigger projections

whereby the trigger lever is pivotal about such apertures in moving the trigger lever to a locked position where said lugs are positioned in said blister means.

5,067,841

BALL JOINT

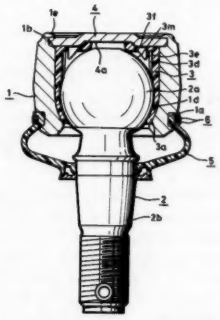
Takao Fukukawa, Fukuroi, and Keiichiro Suzuki, Hamana, both of Japan, assignors to Kabushiki Kaisha Somic Ishikawa, Tokyo, Japan

Filed Jan. 15, 1991, Ser. No. 641,484

Claims priority, application Japan, Jan. 16, 1990, 2-6667

Int. Cl.[5] F16C *11/00*

U.S. Cl. 403—140 **6 Claims**



6. A ball joint for supporting a ball comprising:

a socket;

said socket including a generally cylindrical upper portion and a bowed lower portion forming an inwardly bowed inner surface;

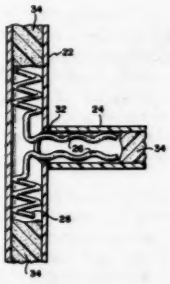
a ball seat;
said ball seat including a generally cylindrical lower portion fittable into said cylindrical upper portion of said socket;
a preload contact element;
means for resiliently fixing said preload contact element to an upper end of said cylindrical upper portion;
means for a lower portion of said generally cylindrical lower portion of said ball seat to be forced into conforming contact with said bowed inner surface to form a bowed lower seat portion;
an inner surface of said bowed lower seat portion having a radius curvature about equal to a radius of curvature of said ball;
means for permitting said preload contact element to be held in resiliently urged contact with an upper portion of said ball;
means for retaining said ball seat in said socket; said means for retaining including a plug fittable into an upper portion of said socket, and a swaged portion retaining said plug in place;
said plug including a plug bottom contacting said preload contact element and applying a predetermined amount of preload through said preload contact element to an upper surface of said ball;
said means for resiliently fixing including;
a generally cylindrical annular wall affixed at its upper end to an upper portion of said ball seat; and
a generally annular space between said annular wall and said upper portion, whereby at least a portion of said preload contact element is free to move a limited amount into said annular space in changing its radius of curvature.

5,067,842

JOINT ASSEMBLY INCLUDING WIRE REINFORCING ELEMENT AND FOAM MATERIAL

Robert F. B. Ponting, Durban, South Africa, assignor to Kwalu (Proprietary) Limited, Jakobs, South Africa

Filed Dec. 13, 1989, Ser. No. 450,173
Int. Cl.[5] F16B *12/04*; F16L *13/11*
U.S. Cl. 403—265 **5 Claims**



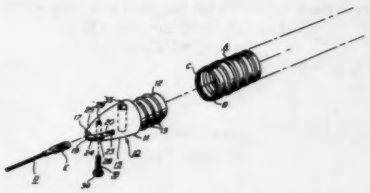
1. A joint assembly comprising:
a first hollow member having a wall with an outer wall surface and an inner wall surface;
a first hole formed in said wall of said first hollow member and passing through said inner and outer wall surfaces intermediate spaced first and second ends of said first hollow member;
a second hollow member having a first end secured to said first hollow member and shaped to engage said first hole of said first hollow member;
adhesive means bonding said second hollow member to said first hollow member at a peripheral portion of said first hole;
at least a first wire reinforcing element having a first coil-shaped portion positioned in said first hollow member and contacting said inner wall surface thereof, and a second portion extending through said first hole and into said first end of said second hollow member; and
a settable expanded foam material within and filling said first and second hollow members at said joint to render said joint assembly impact resistant.

5,067,843

PULLING ATTACHMENT FOR FLEXIBLE CONDUIT

Wallace B. Nova, 25261 Turf Ave., Mission Viejo, Calif. 92691

Filed Sep. 25, 1989, Ser. No. 412,085
Int. Cl.[5] F16B *7/18*
U.S. Cl. 403—301 **12 Claims**



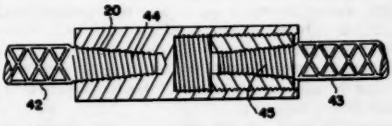
1. An attachment for releasably joining a flexible metal conduit, of the type having a convolute inner wall surface, in which said wall surface is formed with a helical groove extending rearward from a front annular wall surface, to an eye provided in one end of a flexible cable leader of the type attachable to a fish tape, said attachment comprising an elongated, rigid one-piece body having;
a. a generally circularly symmetric, rear cylindrical section having an outer cylindrical wall surface which has a raised helical rib of generally uniform cross-sectional shape, said rib being longitudinally disposed and of the proper size, shape and pitch to adapt said rear cylindrical section of said attachment to threadingly engage said helical groove of said convolute inner wall surface of said conduit, and
b. a tapered, generally frusto-conically shaped front section coaxial with and joined to said rear section, said front section having
i. a transversely disposed front face,
ii. a longitudinally disposed slot extending rearward from said front face, said slot forming in said front section first and second laterally spaced apart jaw sections adapted to insertably receive said eye of said cable leader, and
iii. at lease one transversely disposed hole through said first jaw section, said hole communicating with said slot and being adapted to lockingly receive a pin disposed through said eye of said cable leader.

5,067,844

REINFORCING BAR COUPLER

Geoffrey M. Bowmer, Oisterwijk, Netherlands, and John E. Groth, Cleveland Heights, Ohio, assignors to Erico International Corporation, Solon, Ohio

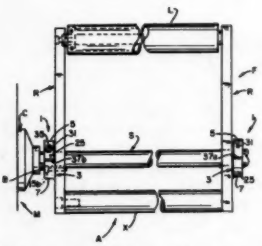
Filed Sep. 28, 1987, Ser. No. 101,633
Int. Cl.[5] F16B *7/18*
U.S. Cl. 403—305 **18 Claims**



1. A coupler for concrete reinforcing bar and the like comprising a sleeve having internal cylindrical threads, a radially expansible axially slit collar insert in said sleeve in threaded

engagement with the internal threads of said sleeve, and tapered internal threads on said insert adapted to be threaded onto tapered external threads on the opposite ends of such bar, the area of cylindrical threaded engagement between the insert and sleeve substantially enclosing the area of tapered threaded engagement between the insert and bar wherein the internal threads of the sleeve and the external threads of the insert, and the internal tapered threads of the insert and the external tapered threads of the bar match whereby the insert may be rotated in the sleeve while the insert simultaneously engages the taper thread of the bar.

5,067,845
CLAMP-HUB
Charles Schlueter, 10132 Elba La., St. Louis, Mo. 63137
Filed Dec. 6, 1990, Ser. No. 623,211
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—344 **19 Claims**



1. A clamp-hub for use with a machine to attach a component to the machine to convert the machine from one type operation to another, comprising:

a clamp-hub body having a first section and a second section, said second section having a greater thickness than the first section and said second section being attachable to the component;

a bore extending through the body for attachment of the body to a portion of the machine; and,

clamping means on the first body section for tightening the clamp-hub about the machine shaft to attach the component to the machine, the clamp-hub having an inner face and an outer face, when the clamp-hub is attached to the machine, the outer face of the clamp-hub being uniform across the length and breadth of the clamp-hub, and the inner face having an inset at the intersection between the first and second sections whereby the inner face of the second section abuts the contacting surface of the component but the inner face of the first section is spaced apart therefrom.

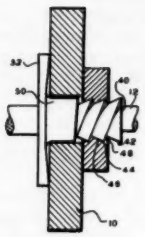
5,067,846
MOUNTING DEVICE
Tadeusz Staniszewski, Budd Lake, N.J., assignor to Shap Inc., Demarest, N.J.
Filed Sep. 4, 1990, Ser. No. 577,285
Int. Cl.[5] F16B *7/04*
U.S. Cl. 403—370 **12 Claims**

1. A mounting device for mounting a machine element having a bore coaxially on a shaft, comprising:

a first member having internal threads;

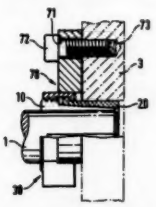
a split sleeve having a sleeve axis and external threads adapted to be mounted around said shaft and inside said bore, said theads of said split sleeve having apexes at a uniform diameter when unstressed, said first member being threaded on said external threads of said split sleeve, said sleeve including:

a second member spaced from said first member by an amount sufficient to allow said first and second members to embrace said machine element, the threads of said first member and said split sleeve being shaped with an asymmetrical profile to cause compression of said sleeve as said first and second members embrace said machine element,



said first and said second members having opposing faces transverse to said sleeve axis and shaped to compress said machine element axially outside said bore.

5,067,847
CLAMPING SET FOR TRANSMITTING TORQUE AND/OR AXIAL FORCES
Ralph Muellenberg, Im Wiesengrund 6, D-4048 Grevenbroich 12, Fed. Rep. of Germany
Filed Oct. 23, 1989, Ser. No. 426,598
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835894
Int. Cl.[5] B25G *3/20*
U.S. Cl. 403—370 **17 Claims**



17. A clamping set for transmitting forces between an inner component, having a cylindrical outer peripheral surface, and at least one outer component arranged thereon, said outer component having a recess forming a cylindrical inner peripheral surface, said clamping set comprising:

an inner taper ring having a cylindrical inner peripheral surface adapted to bear on the outer peripheral surface of the inner component, and having a tapered outer peripheral surface;

an outer taper ring with an outer peripheral surface adapted to bear against the cylindrical inner peripheral surface of the recess, and having a tapered inner peripheral surface adapted to interact with the tapered outer peripheral surface of the inner taper ring;

said inner and outer taper rings tapering from respective thin-walled ends to thick-walled ends; and

a screw ring adapted to be screwed onto a threaded portion of the inner taper ring, said screw ring having a radially inwardly projecting peripheral collar which grips behind a radially outwardly projecting peripheral collar of the outer taper ring;

a device which is provided on said screw ring and which rotatably fixes the screw ring to the outer component;

wherein the peripheral projecting collar of the outer taper ring is disposed at the thin-walled end of the outer taper ring and projects radially outward beyond said outer peripheral surface of the outer taper ring, which outer peripheral surface is located toward the thick-walled end of the outer taper ring;

wherein the threaded portion of the inner taper ring is pro-

vided on the thick-walled end of the inner taper ring and projects radially outward beyond the outer peripheral surface of the outer taper ring and beyond the outer peripheral surface of the projecting peripheral collar; and

wherein the inner and the outer taper rings have a radially continuous longitudinal slot at least in the area of the tapered surfaces.

5,067,848

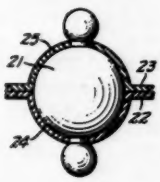
CONNECTOR AND METHOD FOR USE THEREOF

John A. Hilgli, 164 W. 83rd St., New York, N.Y. 10024

Filed Mar. 23, 1990, Ser. No. 498,202

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—406.1 **12 Claims**



1. A device for connecting two walls, which comprises:

(a) two relatively lightweight, flat, and thin walls, each of said walls including a cavity, both cavities having essentially the same dimensions and each cavity having an opening at its base; and

(b) a separate connecting element for joining said two walls, said connecting element comprising a central element which is connected to two diametrically opposed necks of essentially equal dimensions, each of said necks being attached to a distal element, each said distal element being of essentially the same dimensions as the other distal element and each distal element being of lesser diameter than said central element and of greater diameter than the neck to which it is attached.

5,067,849

MARKING NAIL HAVING BODY SUITABLE FOR MAGAZINE FEEDING AND MECHANICAL INSTALLATION

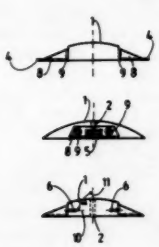
Hermann Silbernagel, Friesenheimerstrasse 7a, D-6800 Mannheim 1, and Ulfried Wiegand, Bleckede, both of Fed. Rep. of Germany, assignors to Hermann Silbernagel, Mannheim and Beiersdorf AG, Hamburg, both of, Fed. Rep. of Germany

Filed Dec. 8, 1989, Ser. No. 446,102

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1988, 8815134[U]

Int. Cl.[5] E01F *9/06, 9/10*

U.S. Cl. 404—9 **15 Claims**



1. A road-marker comprising:

a body having a substantially hemispherical shape and a vertical axis;

means, formed in the body, for magazine feeding the body;

means, formed in the body, for mechanically grasping the body; and

cat's-eye reflectors disposed on the body.

5,067,850

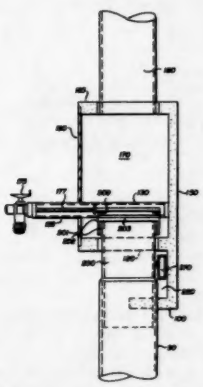
APPARATUS FOR DETECTION AND CONTAINMENT OF POLLUTANTS IN A DRAINAGE SYSTEM

Robert L. Gray, Winchester, Va., assignor to Gray Engineering, Inc., Winchester, Va.

Filed Aug. 31, 1990, Ser. No. 575,864

Int. Cl.[5] E02B *7/20*

U.S. Cl. 405—92 **22 Claims**



1. A storm drainage system, comprising:

at least one conduit means for guiding liquid;

a gate disposed on said conduit means, said gate in an open position allowing said liquid to pass by said gate within said conduit means and in a closed position blocking passage of said liquid within said conduit means; and

means for remotely activating said gate to occupy said closed position in response to an operator's detection of the presence of a pollutant within said conduit means.

5,067,851

COLLAPSIBLE SHEET DAM

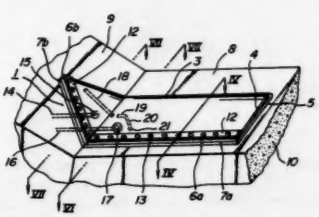
Masao Fujisawa, Chigasaki; Satoshi Tagomori, Yokohama; Mamoru Takasaki, Tokyo, and Yoshihiro Sato, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 27, 1990, Ser. No. 634,904

Claims priority, application Japan, Dec. 28, 1989, 1-338332

Int. Cl.[5] E02B *7/04*

U.S. Cl. 405—115 **6 Claims**



1. A collapsible sheet dam comprising; a flexible rubber sheet bag fixed onto riverbed and riverbank portions of a river in a direction crossing with the river, a fluid supply and discharge port formed in the bag and opening to a surface of the riverbank portion for the inflation and deflation of the bag, means for fixing free end portions of folded parts of said sheet onto said riverbed and riverbank portions at an upstream side of the

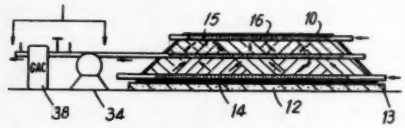
river for the formation of said bag, a portion of a lower folded part provided with said fluid supply and discharge port being fixed by said means for fixing onto the riverbank portion in a region ranging from the riverbank portion to the riverbed portion at a downstream side of said port so as to surround a portion of said fluid supply and discharge port.

5,067,852

METHOD AND APPARATUS FOR REMOVING VOLATILE CONTAMINENTS FROM CONTAMINATED SOIL

James B. Plunkett, Brunswick, Me., assignor to J. B. Plunkett Associates, Inc., Brunswick, Me.

Filed May 24, 1990, Ser. No. 528,581
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—128 **15 Claims**



1. A method for removing volatile contaminants from contaminated soil comprising the steps of:

(a) excavating soil contaminated with volatile contaminants in liquid and absorbed phases and stockpiling the contaminated soil;

(b) covering and sealing the contaminated soil with a vapor-tight liner to create a vapor-tight enclosure having air supply and exhaust means; and

(c) inducing air flow via said air supply means, through the contaminated soil and out said exhaust means to thereby create sufficient negative pressure in the contaminated soil to encourage organic contaminants in the liquid and absorbed phases to achieve a vapor phase; and

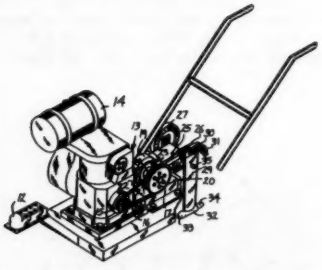
(d) removing the organic contaminants in the vapor phase from said enclosure.

5,067,853

OSCILLATING PLOW APPARATUS

Bernard Radnis, 7533 Garden Ln. Ave., Justice, Ill. 60458

Filed Jul. 19, 1990, Ser. No. 554,563
Int. Cl.[5] F16L *1/00*; E02F *5/10*
U.S. Cl. 405—182 **8 Claims**



1. An oscillating plow apparatus comprising, in combination,

a platform, the platform including a yoke means mounted at a forward end of the platform for securement of the platform to an associated tow vehicle, and

a drive motor mounted on the platform rearwardly of the yoke means, and

the drive motor including an output shaft, the output shaft including a drive sprocket orthogonally mounted to the output shaft, and

a driven shaft rotatably mounted on the platform rearwardly of the drive motor in a parallel relationship to the output shaft, the driven shaft including a driven sprocket mounted on the driven shaft, wherein the driven sprocket is arranged in a common plane with the drive sprocket, and

a drive chain in operative communication with the driven sprocket and the drive sprocket, and

the driven sprocket including an eccentric crank pin, the crank pin including a connecting rod directed rearwardly of the crank pin, and the connecting rod including a rear connecting rod end, and

an oscillating beam mounted orthogonally through the platform rearwardly of the driven shaft, with the rear connecting rod end mounted at an upper terminal end of the oscillating beam, the oscillating beam pivotally mounted to the platform underlying the connecting rod, and

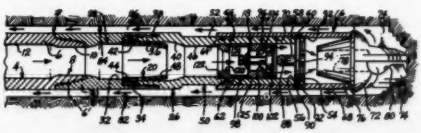
the oscillating beam including an oscillating foot orthogonally mounted to a lower terminal end of the oscillating beam.

5,067,854

APPARATUS AND TECHNIQUE FOR INSTALLING AN ELONGATED ROD IN AN EARTH FORMATION

Gerald T. Sweeney, Puyallup, Wash., assignor to Aardvark Corporation, Puyallup, Wash.

Filed Feb. 4, 1991, Ser. No. 650,307
Int. Cl.[5] E02F *5/10*
U.S. Cl. 405—184 **65 Claims**



1. In the process of installing an elongated rod in an earth formation, the steps of:

installing in a tunnel in the earth formation, an elongated tubular casing having a longitudinally extending bore therethrough,

relatively advancing the rod telescopically through the length of the casing in the bore thereof, and thence into the tunnel from the casing at the distal end of the bore, to the extent that a portion of the rod is projected into the tunnel relatively tandemly ahead of the casing,

anchoring the rod to the wall of the tunnel at the relatively tandemly projected portion of the rod, and

retracting the casing in the direction of the mouth of the tunnel to uncover the casing from around the remainder of the rod while the rod is anchored to the wall of the tunnel.

5,067,855

CASING FOR CONTAINING CAMERAS, VIDEOCAMERAS, FLASHLIGHTS PORTABLE RADIOS AND OTHER ARTICLES WHICH CAN BE USED IN SCUBA DIVING

Shigeki Kamitani, 8-1-933, Nakahara 1-chome, Isogo-ku, Yokohama-shi, Kanagawa-ken, 235, Japan

Filed Nov. 20, 1989, Ser. No. 438,207
Claims priority, application Japan, Nov. 21, 1988, 63-151498[U]
Int. Cl.[5] B63C *11/02, 11/44*
U.S. Cl. 405—186 **7 Claims**

1. An apparatus for regulating the pressure within a submerged casing having a walled exterior and a hollow interior, comprising:

an air source for pressurizing the interior of the casing;

first pressure reduction means connected to the air source for reducing the pressure of the air exiting therefrom; and

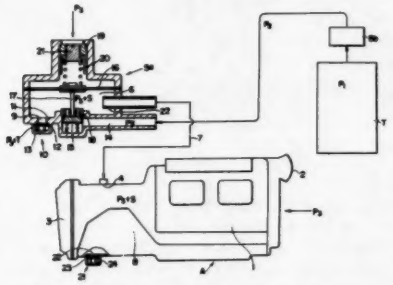
second pressure reduction means for reducing the pressure

of the air exiting from the first pressure reduction means, the second pressure reduction means including:

a primary air compartment connected to the first pressure reduction means;

a secondary air compartment connected to the interior of the casing by a tube passing through the exterior thereof, the secondary air compartment having exhaust valve means for releasing air to the water until the pressure in the interior of the casing is equivalent to a surrounding water pressure;

a diaphragm;



a valve connected to the diaphragm for regulating a flow of air between the primary and secondary air compartments;

means for varying the position of the diaphragm with respect to the second pressure reduction means in response to a change in the surrounding water pressure; and

means for manually controlling the position of the diaphragm to increase the pressure of the interior of the casing above the surrounding water pressure.

5,067,856

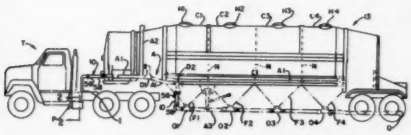
IN-LINE AIR FILTER FOR DRY BULK TANK TRAILERS

David E. Sisk, R.R. 1, Box 340, Bonne Terre, Mo. 63628

Filed Jun. 11, 1990, Ser. No. 535,572

Int. Cl.[5] B60P *1/60*

U.S. Cl. 406—41 **6 Claims**



1. A filter assembly for use with a dry bulk type tank trailer for transporting commodities, the trailer having an air line by which air from an air pump is directed to outlet assemblies of compartments within the trailer to which commodities are stored to unload the commodities, the filter assembly comprising:

a cleanable air filter element capable of removing dirt, dust, and other deleterious particles entrained in the air stream flowing from the pump through the air line;

a housing in which the filter element is removably installed, the housing being installable in-line in the air line;

coupling means at each end of the housing for connecting the housing in the air line, the coupling means comprising a cam lock coupler on each end of the housing;

the filter element is of a frusto-conical shape, wherein the larger diameter end of the filter assembly has a circumferential flange formed thereabout;

the housing comprising two sections with the flange portion of the filter element being capturable between adjacent ends of the sections to install the element in the housing;

clamping means fitting over the outside of the housing, at the juncture between the housing sections, to clamp the sections together, said filter element functioning as a check valve to prevent the reverse flow of air through the air line due to developed pressure differentials within the trailer and its site of unloading, whereby said filter assembly being removably installed in-line of the air line and for removing any dirt, dust and rust particles entrained within the air stream flowing through the air line while removing commodities from the various outlet assemblies of the trailer compartments during their unloading.

5,067,857

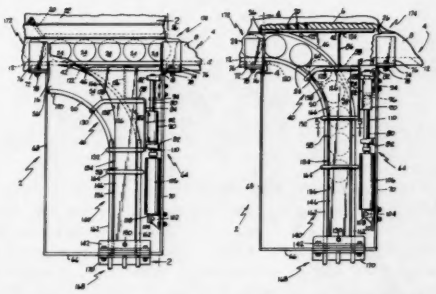
APPARATUS FOR DIVERTING THE MOVEMENT OF CYLINDRICAL BODIES

Thomas J. Ward, Lakewood, Colo., assignor to Coors Brewing Company, Golden, Colo.

Filed Apr. 27, 1990, Ser. No. 515,245

Int. Cl.[5] B65G *51/18*

U.S. Cl. 406—181 **14 Claims**



1. A conveying apparatus for use in moving cylindrical bodies from one location to other locations comprising:

an air conveyor for moving cylindrical bodies in a generally horizontal path;

said air conveyor having a top wall portion through which air is directed onto said cylindrical bodies, a pair of opposite sidewall portions for guiding said cylindrical bodies and a generally horizontal open bottom wall portion

formed by a pair of spaced apart track means for supporting said cylindrical containers during said movement thereof;

a portion of said pair of spaced apart track means forming said bottom wall portion being cut away to form an opening therein through which said cylindrical bodies can pass;

a diversion gate mounted for reciprocal movement in generally vertical directions between a first location and a second location;

said diversion gate, when in said first location, having a generally horizontal support section located in said cut away portion for cooperating with said spaced apart track means in supporting said cylindrical bodies during said movement in said generally horizontal path;

said diversion gate, when in said second location, having an arcuate guide section for contacting said cylindrical bodies and diverting said cylindrical bodies out of said generally horizontal path and into another path;

moving means for moving said diversion gate between said first and second locations; and wherein

said generally horizontal support section comprises a pair of generally horizontal, spaced apart rods; and

said arcuate guide section comprises a first pair of arcuate, spaced apart rods and a second pair of arcuate, spaced apart rods located a distance from said first pair of arcuate, spaced apart rods to form an arcuate passageway for said cylindrical bodies, said arcuate passageway having an entrance portion and an exit portion.

5,067,858

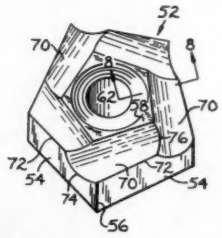
MULTIPLE FACED CUTTER INSERT

Warren R. Cook, 5611 Dogwood Dr., Jackson, Mich. 49201

Filed Apr. 10, 1991, Ser. No. 682,980

Int. Cl.[5] B23B *27/22*

U.S. Cl. 407—114 **6 Claims**



1. A cutter insert characterized by its ability to support cutting insert apexes to avoid fracture and control chip flow comprising, in combination, a body of hard material having a plurality of lateral sides, a top surface and a bottom surface, adjacent lateral sides intersecting at corner edges to define an included angle substantially between 108° and 120°, an elongated concave chip forming recess defined in said body top surface adjacent to and intersecting each lateral side and lateral side corner edge defining a cutting edge at the intersection with the associated lateral side, said corner edges defined by intersecting lateral sides defining sharp apexes free of radii and said concave recesses at said corner edges defining a chip flow surface at the associated cutting edge substantially perpendicular to the associated cutting edge at the associated corner edge.

5,067,859

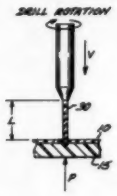
METHOD FOR DRILLING SMALL HOLES IN PRINTED CIRCUIT BOARDS

John A. Korbonski, San Juan Capistrano, Calif., assignor to Systems Division Incorporated, San Juan Capistrano, Calif.

Filed Feb. 15, 1990, Ser. No. 480,748

Int. Cl.[5] B23B *35/00, 41/14*

U.S. Cl. 408—1 R **16 Claims**



1. A method for drilling a printed circuit board, comprising the steps of:

placing an entry overlay sheet on top of said printed circuit board, wherein said entry overlay sheet is a homogenous layer comprising a polymer material having a thickness of about ten thousandths of an inch or smaller, said material selected to have a sufficiently high melting temperature to withstand the heat generated by the drill during the drilling process; and

drilling through the entry overlay sheet and printed circuit board in succession.

5,067,860

APPARATUS FOR REMOVING BURRS FROM WORKPIECES

Hisamine Kobayashi, and Toshiharu Shimizu, both of Nagoya, Japan, assignors to Tipton Manufacturing Corporation, Aichi, Japan

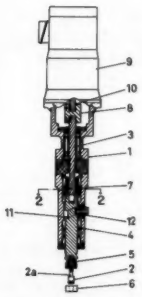
Division of Ser. No. 374,919, Jul. 3, 1989, Pat. No. 4,993,196.

This application Aug. 13, 1990, Ser. No. 567,651

Claims priority, application Japan, Aug. 5, 1988, 63-196617

Int. Cl.[5] B23C *3/12*; B24B *33/02*

U.S. Cl. 409—185 **2 Claims**



1. An apparatus for removing burrs from a workpiece having a bore, comprising:

a housing having a projection mounted thereon;

a rotary shaft mounted to said housing;

power supply means for rotating said rotary shaft;

a tool shaft having a rotary tool at a tip end thereof;

means for connecting said tool shaft to said rotary shaft such that said tool shaft is rotatable with said rotary shaft and can slide axially relative to said rotary shaft;

means for imparting reciprocating motion to said tool shaft

such that said tool shaft reciprocates one to three times during one complete rotation of said rotary shaft; and

wherein said reciprocating motion imparting means comprises a slit or recess formed in said tool shaft to engage said projection.

5,067,861

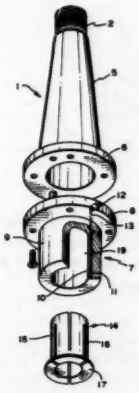
TOOL HOLDER WITH INTERCHANGEABLE FLUID PRESSURE ACTUATED CHUCKS

Jan Danielsen, Romellsvagen 5, 703 56 Orebro, Sweden

Continuation of Ser. No. 342,246, Apr. 20, 1989. This application Oct. 16, 1990, Ser. No. 598,068

Int. Cl.[5] B23B *31/20*

U.S. Cl. 409—234 **2 Claims**



1. A tool holder adapted for use with a drive motor, said tool holder comprising a drive unit having a frustum-conical configuration with a first end mountable to said motor to be driven thereby, and a separate self-contained chuck unit for receiving a tool bit, said drive unit including a second end remote from said first end, said second end including a peripheral flange thereabout, said chuck unit including an inner end with a peripheral flange thereabout, and an outer end, a tool bit recess defined in said chuck unit inwardly through said outer end, said recess including a closed inner end and a continuous peripheral wall with a sealed cavity defined therebehind, fluid means filling said cavity, means for varying pressure on said fluid means, said peripheral recess wall being flexible in response to variations in the pressure on the fluid means for a selective expanding and contracting of said recess wall to selectively grip and release an inserted tool bit, the peripheral flanges of said drive unit and said chuck unit being directly engageable with each other, and releasable fastener means through said flanges for securing said flanges to each other to mount said chuck unit on said drive unit, said fastener means comprising screw means engaged through said flanges, said means for varying the pressure within said cavity, and flexing said recess wall in response thereto, comprising a channel within said chuck unit communicating with said cavity and extending therefrom, and an adjustment screw threaded in said chuck unit and into said channel for varying the volume therein and hence the pressure in said channel and the cavity communicating therewith to define a self-contained fluid pressure system within said chuck unit to enable the engagement and positioning of a tool bit in said chuck unit independent of said drive unit, said chuck unit, through the releasable fastener means, being interchangeable with similar self-contained chuck units having fluid pressure systems and peripheral flanges engageable with the drive unit flange.

5,067,862

UNITARY CARRYING ASSEMBLY OR UNIT FOR MOTOR-CAR TRAILER VEHICLES

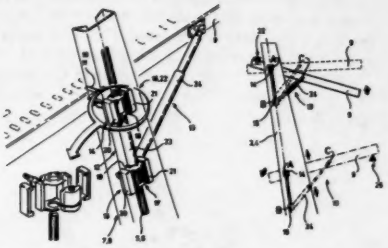
Jean-Luc Andre, Dangolsheim, France, assignor to Lohr Industrie, S.A., Les Coteaux, France

Filed May 31, 1989, Ser. No. 359,308

Claims priority, application France, May 31, 1988, 88 07385

Int. Cl.[5] B60P *3/08*; B61D *3/18*

U.S. Cl. 410—26 **16 Claims**



1. A support assembly, comprising:

a pair of laterally spaced upstanding support posts (3,4);

a platform (9) interposed between said laterally spaced upstanding support posts (3,4);

first means (14) operatively connected to said platform (9) at a first location (A) upon said platform (9) and movable along said posts (3,4) so as to permit movement of said platform (9) with respect to said posts (3,4);

second means (13) having one end thereof movably mounted upon said posts (3,4) at a second location (B) which is spaced upon said posts (3,4) a first distance (AB) from said first location (A) of said first means (14) upon said platform (9), and a second end thereof operatively connected to said platform (9) at a third location (C) which is spaced a second distance (BC) from said second location (B) of said one end of said second means (13) movably mounted upon said posts (3,4);

drive means (5,6) operatively connected with said first means (14) and said one end of said second means (13) for moving said first means (14) and said one end of said second means (13) along said support posts (3,4); and

means for defining said first and second distances (AB,BC) between said first and second locations (A,B), and between said second and third locations (B,C), so as to satisfy one of the relationships wherein (1) said first distance (AB) is fixed while said second distance (BC) is variable, (2) said first distance (AB) is variable while said second distance (BC) is fixed, and (3) said first and second distances (AB, BC) are both fixed, while said drive means (5,6) is operatively driven so as to move said first means (14) and said one end of said second means (13) along said support posts (3,4) whereby the orientation and location of said platform (9) relative to said posts (3,4) may be predeterminedly defined.

5,067,863

CHANNEL NUT

Joseph W. Kowalski, Florissant, Mo., assignor to B-Line Systems, Inc., Highland, Ill.

Continuation of Ser. No. 479,347, Feb. 13, 1990, abandoned. This application Dec. 5, 1990, Ser. No. 622,754

Int. Cl.[5] F16B *27/00*

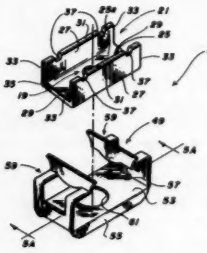
U.S. Cl. 411—85 **11 Claims**

1. For securement to metal framing having a slot and inside and outside faces on opposite sides of the slot for attachment of parts to the framing through the slot from the outside of the slot, a fastening comprising:

an elongate body having a first face constituting an inside face and an opposite face constituting an outside face,

opposite sides, and opposite ends, the width of said body between said sides being less than the width of the slot in the framing whereby the body may be generally aligned with the slot, entered into the slot and passed through the slot from the outside to the inside of the framing and then turned to extend in generally crosswise position relative to the slot for engagement of portions of the outside face of the body adjacent the ends of the body with the inside faces of the framing at opposite sides of the slot; and

means for clamping the body in its said crosswise position comprising a carrier including an elongate platform having a first face constituting an inside face and an opposite face constituting an outside face with means for rotatably mounting the body on the outside face of the platform, opposite sides, and opposite ends, the width of said platform between said sides being less than the width of the slot in the framing whereby the platform with the body generally aligned with the platform may be generally



aligned with the slot, entered into the slot and passed through the slot from the outside to the inside of the framing, the length of said platform between said ends being sufficient to permit the body to rotate on the platform, said platform being suspended o a pair of resilient non-linear arms which are adapted to bridge the slot and engage the outside faces of the framing, said non-linear arms, when unstressed, being adapted to support the body on the platform such that the outside face of the body is at a level outward of the inside faces of the framing and, when stressed by an effective inward force applied to the outside face of the body, being adapted to increase in effective length and support the body on the platform at a level with respect to the inside faces of the framing such that the opposite ends of the body can be rotated into generally crosswise position relative to the slot, said stressed non-linear arms providing a spring action tending to draw the body into clamping engagement with the inside faces of the framing on opposite sides of the slot.

5,067,864

SELF-DRILLING FASTENER FOR PLASTERBOARD WALL

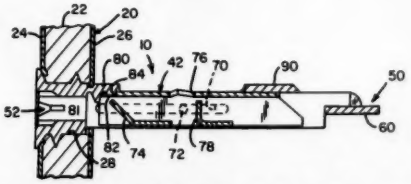
George G. Dewey, Prospect Heights, and Ralph D. Tenuta, Mount Prospect, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jul. 27, 1990, Ser. No. 560,068
Int. Cl.[5] F16B *21/00*
U.S. Cl. 411—344 **20 Claims**

2. A fastener capable of being drilled into a wall, said fastener being used with a screw having a head and an elongate shank with a threaded portion, and comprising:

a fastener body defining a longitudinal axis and having a head, a shank integral with and extending axially from said head of said fastener body, and a pair of elongate arms integral with and extending axially from said shank of said fastener body, said fastener body having an axial bore which extends through said head and said shank of said fastener body, and which is arranged so as toe permit said shank of said screw to be axially moved within said bore; and

a toggle clamp mounted upon said fastener body so as to permit pivotal movement of said toggle clamp relative to said fastener body between an insertion position wherein said toggle clamp is substantially aligned with said axis of said fastener body, and a toggle position wherein said toggle clamp is disposed at a substantially right angle with respect to said axis of said fastener body, and so as to permit axial movement of said toggle clamp relative to said fastener body, said toggle clamp having a thread-accepting aperture which is adapted to form a threaded connection with said threaded portion of said shank of said screw and to effect said axial movement of said toggle clamp relative to said fastener body as said screw is threadedly engaged with said thread-accepting aperture of said toggle clamp after said toggle clamp has been pivoted to said toggle position;



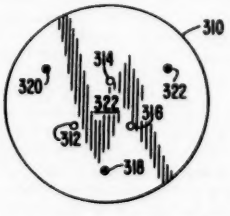
wherein said fastener has a drilling tip for drilling a hole of suitable diameter within said wall so as to accommodate said fastener, except for said head of said fastener body, when said toggle clamp is disposed at said insertion position, a threaded portion defined upon an exterior peripheral portion of said shank of said fastener body for threadedly engaging said wall, and socket means defined within said shank of said fastener body within the vicinity of said head of said fastener body for receiving a tool for imparting rotation to said fastener whereby said drilling tip can drill said hole within said wall in a self-drilling manner and said threaded portion of said shank of said fastener body can threadedly engage said wall in a self-drilling manner in order to respectively insert said toggle clamp through said wall and to fixedly mount said fastener within said wall.

5,067,865

METHOD AND APPARATUS FOR FEEDING TABS OR DISCS TO AN AUTOMATIC STAPLE OR NAIL GUN

Karl H. Zylka, Ft. Lauderdale, and Augustus M. Buckley, Jr., West Palm Beach, both of Fla., assignors to Quick-Tab Fasteners, Inc., Pompano Beach, Fla.

Filed Oct. 30, 1989, Ser. No. 429,148
Int. Cl.[5] F16B *43/00*; B27F *7/02*; B42B *4/00*
U.S. Cl. 411—531 **13 Claims**



1. A disc for use in an automated disc feeding, powdered staple or nail gun, said disc having two opposing, substantially flat, solid planar surfaces and a plurality of raised surfaces protruding from at least one of said planar surfaces such that

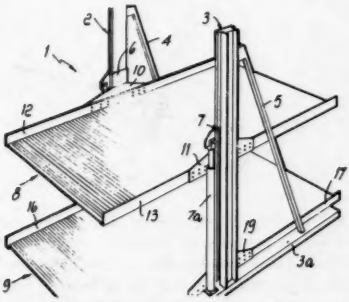
when a plurality of said discs are stacked on top of each other, no planar surfaces contact, said disc being penetrable by nails and staples.

5,067,866

DEVICE FOR GARAGING MOTOR VEHICLES

Angelo Fusaro, and Giancarlo Galeazzi, both of Volta Mantovana, Italy, assignors to A.F.G. S.r.l., Volta Mantovana, Italy

Filed Jun. 14, 1990, Ser. No. 537,732
Int. Cl.[5] E01F 9/00
U.S. Cl. 414—228 22 Claims



1. Device for garaging motor vehicles comprising;

at least one base element;

at least two substantially vertical guides extending upwardly from said base element,

at least one first slider and at least one second slider, each slider being slideably associated with at least one of said guides,

actuation means for simultaneously sliding said first slider and said second sliders along said guides,

at least two vertically spaced-apart platforms rigidly connected to said first slider and said second slider, wherein each of said platforms comprises;

panel means for bearing wheels of motor vehicles, and

gutter means connected to said panel means for conveying liquids away from said motor vehicle wheels supported on said panel means,

whereby to prevent any liquids from dripping onto vehicles accommodated on an underlying platform, and whereby to prevent said panel means from retaining liquids which would remain in contact with said motor vehicle wheels supported on said panel means, wherein each of said platforms further comprises;

at least one bracket connected to said first slider,

at least another bracket connected to said second slider,

at least one first profiled element connected to said one bracket, and

at least one second profiled element connected to said other bracket,

wherein said gutter means comprise;

at least one gutter formed on said first profiled element and

at least one gutter formed on said second profiled element, and

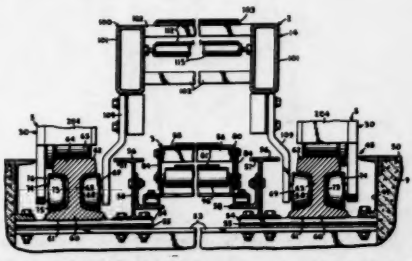
wherein said panel means of each of said platforms comprise a plurality of panels, each panel among said plurality of panels being connected to said one profiled element and to said other profiled element.

5,067,867

CONVEYOR FOR MIXED FREIGHT HANDLING SYSTEM

Carl J. Ruder; Ronald J. Haney, both of Overland Park, Kans.; Richard J. Chutorash, Portland; Wayne W. Bostad, Forest Grove, both of Oreg.; Arnold A. Zweig, Olympia, Wash., and Lyle B. Payne, Stilwell, Kans., assignors to Yellow Freight System, Inc., Overland Park, Kans.

Division of Ser. No. 280,720, Dec. 6, 1988, Pat. No. 5,009,560.
This application Jan. 14, 1991, Ser. No. 641,070
Int. Cl.[5] B65G 67/08
U.S. Cl. 414—391 14 Claims



1. An article handling conveyor system for transferring articles between spaced apart first and second locations, said second location being within an elongated article transferring vehicle and said first location being external to said vehicle, said system comprising:

(a) an elongated fixed conveyor positioned at said first location;

(b) an elongated movable conveyor positioned at said first location in a straddled vertically spaced parallel relation to said fixed conveyor to communicate articles therewith and movable between a retracted condition at said first location and an extended condition invading said second location while maintaining a portion of said movable conveyor in said straddled vertically spaced parallel relation to said fixed conveyor;

(c) each of said conveyors including means forming respective support surfaces capable of supporting respective moving successions of articles;

(d) said movable conveyor including a substantially horizontal base section; and

(e) said movable conveyor including a lift section pivotally connected to said base section at an end thereof toward said second location, said lift section being selectively inclined upwardly in said extended condition of said movable conveyor.

5,067,868

SWING EJECTOR FOR REAR LOADING COMPACTOR

Robert A. Boda, Rochester, Minn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Filed Jun. 8, 1990, Ser. No. 535,368
Int. Cl.[5] B65F 3/28
U.S. Cl. 414—510 7 Claims

1. A pivoting ejector system for use in a rear-loading, compacting refuse truck having a refuse holding volume, a forward and aft reciprocally slidable ejector in the refuse holding volume and a mechanical means for reciprocally displacing the ejector forward to accommodate loading and aft to unload the refuse, the ejector comprising:

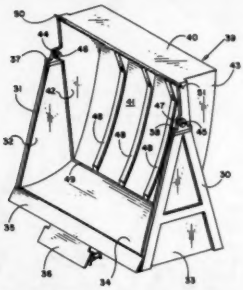
a frame including a bottom frame portion connected to and spacing two parallel, substantially vertical A-shaped sidewall frames;

a pair of spaced pivot support means, one carried by each of the sidewall frames;

a pair of sidewall sheet members, one covering each of the sidewall frames;

the bottom frame portion further including load bearing means adapted to slidably support the ejector and allow it to operate in conjunction with the mechanical means for reciprocally displacing the ejector associated with the refuse truck; and

a scoop-shaped pivoting structure having a top and modestly curved bottom mounted between the pair of sidewall members, the pivoting structure being carried by mounting means journalled in the pair of pivot support means carried by the sidewall frame members such that the pivoting structure is free to pivot forward and aft and having a bottom shape which cooperates with the sidewalls to provide a front for the refuse hauling volume with a modestly curved, substantially vertically disposed front wall when the top of the pivoting structure is pivoted to a rearward position.



5,067,869

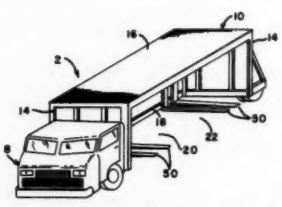
AUTOMOBILE TRANSPORTATION APPARATUS

George F. Reuss, and George D. Reuss, both of 18 Shady La., Irwin, Pa. 15642

Filed Apr. 17, 1990, Ser. No. 510,091

Int. Cl.[5] B60P *3/07*

U.S. Cl. 414—544 **17 Claims**



1. A handling and transportation apparatus for lifting an automobile comprising:

a frame enclosure having an open side and an open bottom;

motor means provided on the frame enclosure;

a first movable means, the first movable means being movable by said motor means relative to the frame enclosure between a first position and a second laterally located position, the first movable means positioned in the open bottom when the first movable means is in the first position,

the first movable means having a first support member and a second support member, the second support member being movable relative to the first support member between an open position and a closed position;

whereby the first member and the second member are positioned on opposed sides of a tire of an automobile when the second member is in the open position, the second member is then moved to the closed position thereby insuring that the first and second members are positioned in engagement with the tire.

5,067,870

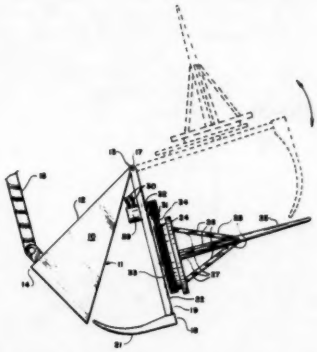
HAY BALE UNROLLER

Leroy Staffanson, Rte. 1 Box 3076, Sidney, Mont. 59270

Filed Jul. 2, 1990, Ser. No. 548,275

Int. Cl.[5] B66C *23/18*

U.S. Cl. 414—724 **3 Claims**



1. A bale handling device adapted for use in operable joinder with a front-end bucket loader equipped with a bucket having an interior region bounded in part by a rear panel having upper and lower edges, said lower edge being pivotally supported by paired lifting arms, said device comprised of:

a) a rectangular grapple framework pivotably associated with said upper edge and comprised of upper and lower horizontal crossmembers spaced apart by parallel side members, said lower crossmember having a row of tooth-like pointed appendages directed toward said interior region,

b) support structure held within said framework,

c) a rigid plate rotatably held by said support structure,

d) a spear post perpendicularly emergent from said plate,

e) a multiplicity of elongated braces having proximal extremities fixedly associated with said plate in a circular locus, and distal extremities attached to said spear post in a manner disposing said braces in a conical array, and

f) a drive motor and associated power transmission means to controllably rotate said plate.

5,067,871

PROCEDURE FOR HORIZONTAL STORAGE OF PAPER ROLLS

Walter Hilber, Ausburg, Fed. Rep. of Germany, assignor to Kone Oy, Helsinki, Finland

Filed Jul. 18, 1989, Ser. No. 381,349

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1988, 3824328

Int. Cl.[5] B65G *1/04*

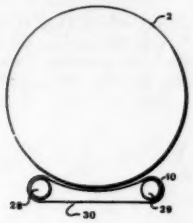
U.S. Cl. 414—786 **4 Claims**

1. A procedure for the horizontal storage of paper rolls in a storage shelving assembly, comprising the steps of:

individually placing and then horizontally storing each of said paper rolls on a first bearing surface (30) which deforms to accommodate the arcuate outer layer of the roll and which supports each said paper roll throughout the length thereof by a segment of the outer layer of each roll;

rotating each said paper roll through one or more predetermined angles about a horizontal winding axis thereof at

one or more predetermined intervals of time, by moving said first bearing surface; and



further storing each of said paper rolls in its newly rotated position.

5,067,872

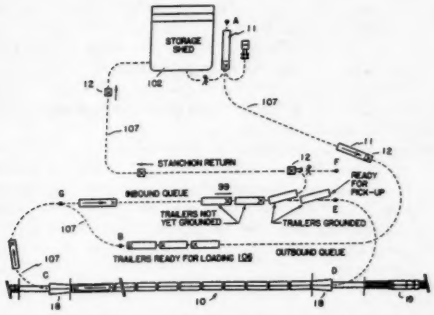
METHOD FOR SEMITRAILER TRANSFER

Thomas H. Engle, Cape Vincent, N.Y., assignor to Knorr Brake Holding Corporation, Rockville, Md.

Division of Ser. No. 195,453, May 24, 1988, Pat. No. 4,973,206, which is a continuation of Ser. No. 64,142, Jun. 18, 1987, abandoned. This application Aug. 10, 1990, Ser. No. 565,397

Int. Cl.[5] B65G *67/00*

U.S. Cl. 414—786 8 Claims



1. The method of loading and unloading a train of flat cars having decks with a plurality of semitrailers having fifth wheel couplings by operation of power stanchions comprising the steps of:

(a) coupling the stanchions to individual ones of the semitrailers,

(b) moving the stanchion coupled semitrailers along a guideway disposed partly in a terminal yard and partly in a path extending along the decks of the flat cars longitudinally of the train by an onboard stanchion guidance means that coacts with the guideway such that inbound semitrailers aboard the train are unloaded and that outbound trailers are loaded from the yard onto the train along such longitudinal path over a plurality of such cars; and

(c) sensing the close proximity of a stanchion to a semitrailer ahead along the guideway, and bringing the stanchion and associated semitrailer to a halt upon a sense of close proximity to such semitrailer ahead.

5,067,873

METHOD OF SEPARATING A COMPONENT FROM A ROW OF COMPONENTS AND APPARATUS FOR CARRYING OUT THE METHOD

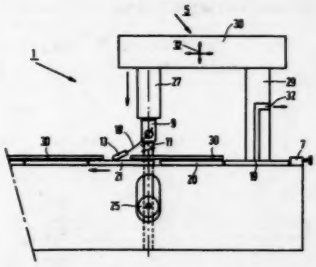
Herman C. Lalesse, Heerlen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1990, Ser. No. 460,797

Claims priority, application Netherlands, Jul. 7, 1989, 8901742

Int. Cl.[5] B65G *59/00*

U.S. Cl. 414—789.9 13 Claims



1. A method of separating a component from a horizontally extending row of components comprising: displacing the row of components in a continuous form over an elongate track in a supply direction into a separation device; separating a component, after the row has come to a standstill, in the separation device from the horizontally extending row and then discharging the separated component from a presentation position; said separating the component in the separation device including linearly displacing the row of components in a continuous form over a predetermined distance from the component to be separated in a direction opposite to the supply direction and maintaining the row of components at a fixed predetermined distance from the separated component.

5,067,874

COMPRESSIVE SEAL AND PRESSURE CONTROL ARRANGEMENTS FOR DOWNHOLE TOOLS

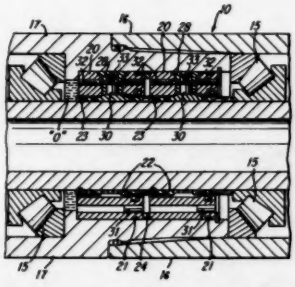
Dean Foote, Edmonton, Canada, assignor to Computalog Ltd., Edmonton, Canada

Filed Apr. 13, 1990, Ser. No. 508,974

Claims priority, application Canada, Apr. 14, 1989, 596698

Int. Cl.[5] F16J *15/40*

U.S. Cl. 415—230 3 Claims



1. A seal and pressure control arrangement for a downhole drilling motor, comprising:

a seal arrangement that includes a first and second seal assembly, at least one of which has a compressible element, wherein an oil-chamber is defined between said first and second seal assemblies and between an outer stationary member and an inner rotating member that is a hollow

shaft through which drilling medium is passed under pressure to drill elements; and

at least one pressure control assembly, including: at least one pressure relief valve for staging the pressure between said first and second seal assemblies, and a rotary element for displacing a piston that controls at least two check valves.

5,067,875

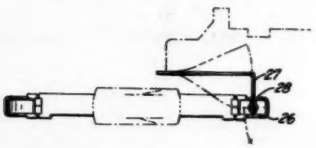
COMPOSITE SCISSORS FOR A SWASHPLATE

Dave H. Hunter, Cheshire; Kenneth L. Lauck, Beacon Falls; Kevin A. White, Shelton; Robert J. Milne, Oxford; Leonard J. Doolin, Southbury, and Stephen V. Poulin, Stratford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 11, 1990, Ser. No. 508,204

Int. Cl.[5] B64C *27/605*

U.S. Cl. 416—114 **19 Claims**



1. A rotor assembly for a helicopter, having a swashplate including a stationery ring and a rotating ring, disposed about a rotor shaft, the rotor assembly further comprising flexible composite scissor means for attaching the rotating ring to the rotor shaft, the composite scissor means having portions of varying flexibility and being sufficiently thin to accommodate vertical and tilting swashplate movement and sufficiently wide to transmit tangential forces and resist twist buckling for rotating the rotating ring.

5,067,876

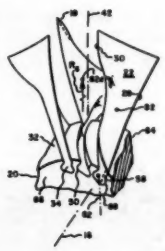
GAS TURBINE BLADED DISK

Otis S. Moreman, III, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 29, 1990, Ser. No. 500,974

Int. Cl.[5] F01D *5/30*

U.S. Cl. 416—219 R **40 Claims**



1. A gas turbine engine rotor blade comprising:

an airfoil having a tip and a root, and a leading edge and a trailing edge extending from said root to said tip;

a dovetail extending from said airfoil root, said dovetail having:

a forward profile disposed adjacent to said airfoil leading edge;

an aft profile generally similar to said forward profile disposed adjacent to said airfoil trailing edge;

a longitudinal axis extending from said forward profile to said aft profile;

a radial axis extending perpendicularly from said longitudinal axis radially outwardly into said airfoil in a plane of said aft profile; and

said forward profile being disposed at an angular position rotated about said dovetail longitudinal axis relative to said dovetail radial axis and said aft profile.

5,067,877

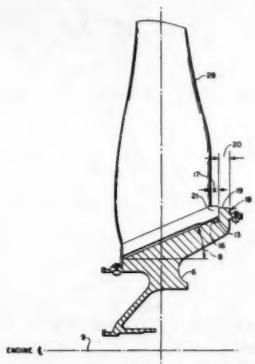
FAN BLADE AXIAL RETENTION DEVICE

Nashed A. Youssef, Mississauga, Canada, assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 11, 1990, Ser. No. 580,709

Int. Cl.[5] F01D *5/32*

U.S. Cl. 416—220 R **3 Claims**



1. A device for retaining a blade for an axial fan having a dovetail root and received within a corresponding dovetail channel in an annular hub, wherein the dovetail channel further slopes radially outward with respect to the fan axis, comprising:

a retaining flange extending radially outward relative to the centerline of the hub, located aft of the dovetail channel and integrally formed of the hub, wherein said flange has an outer diameter large enough to check the blade root from traveling aftward nd a sufficient thickness to sustain axial loads transmitted through the blades;

wherein the fan blade includes an extension of the root end extending out in the aftward direction, contacting said flange, and

wherein the hub includes a circumferential groove in the exterior surface of the hub, located between both said flange and the dovetail channel, wherein said groove width is sufficient to permit removal of a channel cutting machine tool, and wherein said groove depth is at least as great of the depth of the adjacent end of the dovetail channel.

5,067,878

DISCHARGE FLOW BLOCKING VALVE FOR A HERMETIC ROTARY COMPRESSOR

Caio M. F. N. Da Costa, Joinville, Brazil, assignor to Empresa Brasileira de Compressores S/A - Embraco, Joinville, Brazil

Filed Sep. 1, 1989, Ser. No. 402,039

Claims priority, application Brazil, Sep. 6, 1988, 8804678[U]

Int. Cl.[5] F04B *39/00*

U.S. Cl. 417—312 **17 Claims**

1. A discharge flow blocking valve for a compressor comprising:

a sealed housing,

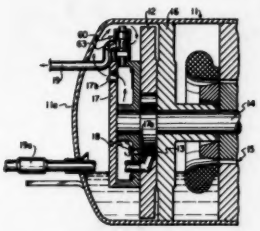
a cylinder and a piston for copressing refrigerant gas within said housing,

a discharge muffler within the housing having an inlet opening communicating with the cylinder discharge volume, a first outlet communicating with the interior of the sealed housing, and a second outlet,

a blocking valve in said housing having an outer casing with

first driving opening for receiving gas in communication with said second outlet of said discharge muffler, and a second driving opening for receiving gas in communication with the housing interior,

said valve casing also having an inlet in communication with the interior of the housing to receive the discharge gas conveyed from the discharge muffler first outlet into the interior of the sealed housing and an outlet in communication with a discharge means extending through and external to said housing,



a piston movable within said valve casing having surfaces communicating with and responsive to the gas pressure at said first and second driving inlets, said piston responsive to a pressure differntial between the gases at said first and second driving inlets when the compressor starts and the pressue at the second outlet of the muffler is greate than the pressure in the compressor having interior for moving the piston to a position to provide fluid communication between said casing inlet and outlet openigns to convey the discharge gas from the sealed housing through the valve casing to the discharge means and out of the housing.

5,067,879

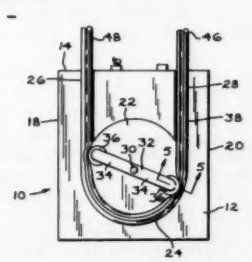
PERISTALTIC PUMP SYSTEM

Walter L. Carpenter, 1833 Mt. Hope Rd., Grass Lake, Mich. 49240

Filed Sep. 18, 1990, Ser. No. 584,144

Int. Cl.[5] F04B *43/12*

U.S. Cl. 417—472 **15 Claims**



1. A flexible resilient tube for peristaltic pumps wherein fluid or gas is propelled through the tube by rotating members transversely progressively compressing the tube at spaced intervals against a raceway, comprising an inlet end, an outlet end, a passage extending therethrough having a surface, an exterior surface, and a pair of longitudinally extending and oppositely disposed notches defined in said exterior surface for enhancing and regulating the flexing characteristics of said tube, said notches having a base, an outer circumferential opening, a radial depth, and inwardly converging side walls.

5,067,880

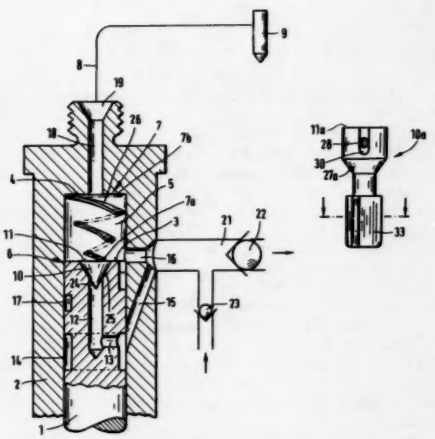
FUEL INJECTION DEVICE

Gerhard Finsterwalder, Bergisch Gladbach; Reda Rizk, Cologne, and Hans G. Michels, Erftstadt, all of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Duetz AG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 518,141, May 3, 1990. This application Apr. 22, 1991, Ser. No. 688,976

Int. Cl.[5] F04B *7/04*

U.S. Cl. 417—495 **11 Claims**



1. In a fuel injection system for a diesel engine including a source of fuel including a low pressure space, an injection valve (9), an injection pump having a plunger bushing (2) with a bore extending to an end wall and a pump plunger (1) sealingly quided in said bore and having an end (3) which together with said bore and said end wall define a high pressure space (5) and an injection line (8) interconnecting said high pressure space (5) and said injection valve (9), the combination comprising:

a conically shaped valve seat (25) formed in said end (3) of said pump plunger (1),

a low pressure passageway interconnecting said valve seat (25) with said low pressure space,

a suction valve (6) in said pump plunger (1) including a suction valve body (10) having a conically shaped portion (27) shiftable axially through a predetermined stroke between a closed position in which it is seated in said conically shaped valve seat (25) thereby preventing fuel flow from said high pressure space (5) to said passageway and an open position in which it is spaced from said seat and said high pressure space (5) is connected in fluid communication with said low pressure space via said passageway, said conically shaped portion having a generally flat end in generally parallel and closely adjacent relation to said end of said pump plunger and

a stroke limiting abutment on said pump plunger in axially abutable relation to said suction valve body operable to limit axial movement of said suction valve body from said closed position a predetermined distance corresponding to said predetermined stroke.

5,067,881

PLUNGER-OPERATED HYDRAULIC PUMP

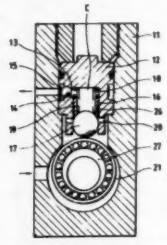
Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Center Ltd., Hanyu, both of, Japan

Filed May 16, 1990, Ser. No. 524,021

Claims priority, application Japan, May 17, 1989, 1-123645; May 25, 1989, 1-130263

Int. Cl.[5] F04B *7/04*

U.S. Cl. 417—498 7 Claims



1. A plunger operated hydraulic pump comprising:

a pump housing;

a cylinder block in the form of a cylinder which is coaxial with a pump shaft, said cylinder block being fitted in a pump housing using elastic seal rings, and having at least two cylinders which are formed therein in such a manner that said cylinders extend radially through said cylinder block;

a piston in the form of a hollow cylinder fitted in each said cylinder;

a plunger fitted in each cylinder in such a manner that each plunger is located below each piston;

a first return spring provided in said cylinder to urge each piston towards an eccentric cam;

a second return spring provided in each cylinder to urge said plunger towards said eccentric cam, each second return spring having a larger elastic force than each first return spring; and

an annular oil pressure chamber formed between the outer cylindrical wall of said cylinder block and the inner cylindrical wall of said pump housing, said annular oil pressure chamber being sealed with said elastic seal rings,

said annular oil pressure chamber communicating with said cylinders through ejection valves and communicating with an ejection port at all times,

said pump shaft being supported by said cylinder block.

5,067,882

DUAL-ACTING, RECIPROCATING PISTON PUMP

James E. DeVries, North Olmsted, Ohio; Samuel R. Rosen, Scottsdale, Ariz., and Robert D. Schneider, Lorain, Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Jun. 20, 1990, Ser. No. 540,934

Int. Cl.[5] F04B *7/00*

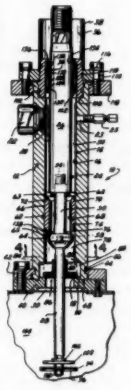
U.S. Cl. 417—511 5 Claims

1. A double-acting, reciprocating piston pump, comprising:

a pump body formed with a passageway defining an internal wall, said passageway having an inlet adapted to communicate with a source of material to be pumped, and a discharge outlet at which material exits said pump body;

a piston assembly movable in first and second directions relative to said pump body, said piston assembly including a first portion located within said passageway in said pump body and a second portion adapted to be inserted within a source of material to be pumped, said first portion carrying a valve seat, said second portion carrying shovel means for scooping material from the source and through said inlet in said passageway of said pump body;

a first check valve carried by said first portion of said piston assembly, said first check valve dividing said passageway into a first pumping chamber connected to said inlet of said passageway and a second pumping chamber connected to said discharge outlet of said passageway, said first check valve being formed with a throughbore and an outer surface slidably engageable with said internal wall of said pump body formed by said passageway, said first check valve being mounted within said passageway by said piston assembly so that said outer surface of said first check valve scrapes away material from said internal wall of said pump body along at least a portion of said first pumping chamber and along said second pumping chamber to said discharge outlet of said passageway, said first check valve and said valve seat being mounted for relative movement between an open position in which said first check valve is spaced from said valve seat and a closed position in which said first check valve contacts said valve seat;



a second check valve located within said passageway and movable between an open position and a closed position relative to said inlet to said passageway, whereby said first check valve is moved to said open position and said second check valve is moved to said closed position in response to movement of said piston assembly in said first direction to force material located in said first pumping chamber into said space between said first check valve and said valve seat, through said throughbore in said first check valve and into said second pumping chamber for emission through said discharge outlet, said first check valve being moved to said closed position and said second check valve being moved to said open position in response to movement of said piston assembly in said second direction to force material located within said second pumping chamber through said discharge outlet and to simultaneously scoop material with said shovel means through said inlet and into said first pumping chamber.

5,067,883

ROTARY INTERNAL COMBUSTION ENGINE

Sofyan Adiwinata, Jalan Kebalen VII/3,, Jakarta, Indonesia

Continuation of Ser. No. 239,688, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 98,189, Sep. 17, 1987, abandoned. This application Jul. 2, 1990, Ser. No. 746,688

Int. Cl.[5] F01C *1/22;* F04C *2/22*

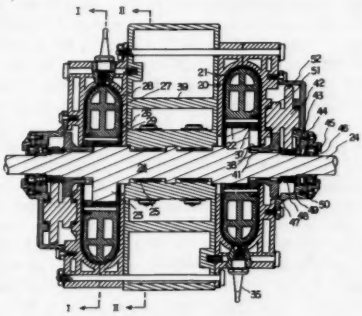
U.S. Cl. 418—61.2 1 Claim

1. A rotary engine comprising a housing cavity having an inner wall shape, as seen in a cross section perpendicular to a longitudinal axis of the cavity, in the form of a two lobed epitrochoidal shape and a three apex rotor installed within the said cavity and movable therearound in a planetary fashion,

and a main crankshaft provided with an eccentric hubshaft supporting said rotor, said rotor and said housing cavity both being radially curved as seen in a cross section taken along the longitudinal axis of the cavity, and wherein the engine further comprises a transmission installed inbetween the rotor and the main crankshaft, said transmission having gears which comprise:

a. an internal ring gear which is fixed or secured to one side of the rotor;

b. a first cluster gears assembly having a hollow shaft for free wheeling with respect to said main crankshaft by means of roller bearings, a smaller gear which functions as a first pinion gear to the said internal ring gear, and a larger gear which is intermeshed to a second cluster gears assembly;



c. the second cluster gears assembly having a separate shaft and comprising a smaller gear which is intermeshed to the said larger gear of the first cluster gears assembly, and a larger gear which is intermeshed to a second pinion gear which is fixed to the main crankshaft; and wherein

d. for the three apex rotor the internal ring gear and first pinion gear the gearing ratio is 4:3; and

e. the gearing ratio of the larger gear of the first cluster gears assembly to the smaller gear of the second cluster gears assembly is 3:1, and the gearing ratio of the larger gear of the second cluster gears assembly to the second pinion gear is 3:1, whereby there is a minimum of gears for space efficiency.

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UNITIZED STRUCTURE OF MAIN BEARING AND CYLINDER OF ROTARY COMPRESSOR

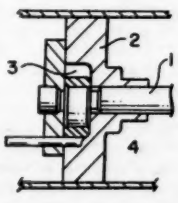
Byung C. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 23, 1990, Ser. No. 557,539

Claims priority, application Rep. of Korea, Jul. 28, 1989, 11013/1989

Int. Cl.[5] F04C *29/06*

U.S. Cl. 418—63 **1 Claim**



1. A rotary compressor comprising: a revolution shaft; a main bearing having a planar base wall fitted around said revolution shaft and aligned orthogonal thereto; a cylinder formed integrally with and directly in said main bearing, said cylinder defining an inner circumferential wall aligned substantially orthogonally to the planar base wall of the main bearing; a curved corner wall extending between the inner circumferential wall and the planar base wall of the main bearing; and a roller eccentrically fitted to said revolution shaft and revolving within said cylinder, said roller comprising an outer cylindrical surface in contact with the inner circumferential wall of said cylinder, a planar wall in contact with the planar base wall of the main bearing and a curved corner wall extending between the planar wall and the outer cylindrical wall and conforming to the shape of the curved corner wall of the main bearing, whereby the curved corner wall of the main bearing and the curved corner wall of the roller enable low friction between the roller and the bearing.

5,067,885

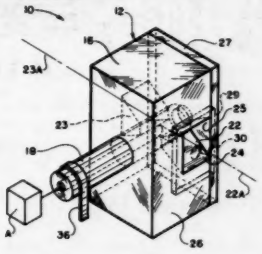
RAPID CHANGE DIE ASSEMBLY

James F. Stevenson, Hudson, and William H. Miller, Wadsworth, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Continuation-in-part of Ser. No. 207,838, Jun. 17, 1988, Pat. No. 4,906,711. This application Feb. 12, 1990, Ser. No. 478,373

Int. Cl.[5] B29C *47/24, 47/22*

U.S. Cl. 425—131.1 **15 Claims**



1. A die assembly for configuring extrudate flow, said assembly comprising,

a die head having a feed member passage, first and second die head passages, and first and second die surfaces, each located in a separate plane, and associated with said first and second die head passages, said die head passages located intermediate said corresponding die surfaces and said feed member passage,

a feed member supported in said feed member passage of said die head for rotation therein for communication with either said first die head passage or said second die head passage and having a longitudinal feed passage and a feed opening, wherein said feed opening is transverse with respect to said feed passage to provide extrudate flow from an extruder to said die head,

said feed opening having a first central axis, said first die head passage having a second central axis and said second die head passage having a third central axis,

said first central axis and said second central axis being movable with respect to one another upon movement of the feed opening or first die head passage with respect to the other of the feed opening or first die head passage, respectively, to correspondingly configure extrudate exiting the first die had passage when said feed opening is in communication with said first die head passage by varying the length of pathways along which extrudate flows through said second die head passage to said second die surface to bend the extrudate as its exits said die head, and

said first central axis and said third central axis also being movable with respect to one another upon movement of the feed opening or second die head passage with respect to the other of the feed opening or second die head passage, respectively, to correspondingly configure extrudate

exiting the second die head passage when said feed opening is in communication with said second die head passage by varying the length of pathways along which extrudate flows through said second die head passage to said second die surface to bend the extrudate as it exits said die head.

5,067,886

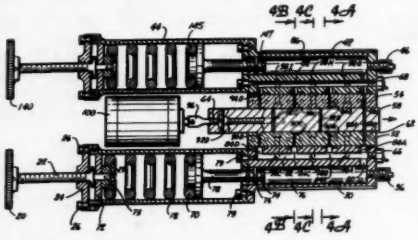
REACTION INJECTION MOLDING MACHINE

Timothy A. Salaba, Burnsville, and Debra L. Wilfong, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 182,910, Apr. 18, 1988, Pat. No. 5,004,351. This application Feb. 1, 1991, Ser. No. 649,666

Int. Cl.[5] B29C *45/18*

U.S. Cl. 425—145 **5 Claims**



4. A reaction injection molding machine comprising:

two metering cylinders with reciprocating pistons disposed therein for pressurizing fluids contained therein;

a pushrod for supporting each piston in its respective cylinder;

a replaceable compression spring positioned to actuate each pushrod;

means for independently compressing each compression spring; and

simultaneously acting valve actuating means for developing impinging streams of fluids expelled from selected cylinders and delivering the resultant mixture to a selected collection vessel.

5,067,887

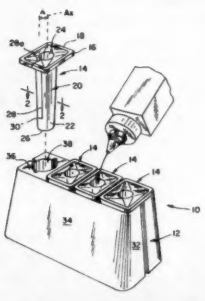
HOT-MELT ADHESIVE RECYCLING SYSTEM

Howard D. Speer, Marriottsville, and Robert A. Shortt, Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 82,474, Aug. 7, 1987, abandoned. This application Mar. 4, 1991, Ser. No. 664,268

Int. Cl.[5] B29C *33/40, 33/50, 39/36*

U.S. Cl. 425—256 **8 Claims**



1. A hot-melt material recycling system for the recovery of hot-melt material and the forming of the recovered material into solid preforms, the system comprising:

a hot-melt dispensing apparatus for receiving a solid hot-melt material preform formed as a cylinder about a longitudinal axis and having a diameter dimension equal to D and a length dimension equal to L, heating the preform to a flowable state, and dispensing the heated material therefrom;

a flexible mold form for receiving dispensed hot-melt material and defining a cylindrical cavity therein having a diameter dimension equal to D and a length dimension equal to L for molding the material into a hot-melt material preform having a diameter dimension equal to D and a length dimension equal to L for re-use in said hot-melt dispensing apparatus;

a mold carrier for holding said flexible mold form;

said flexible mold form comprising a wall portion having an interior surface and an exterior surface, the interior surface defining the cylindrical cavity, the cavity having an open end for receiving the dispensed hot-melt material and having a closed end, a peripheral flange extending around the open end;

said wall portion having a longitudinally slit along a side thereof, a lower end of said slit terminating in a bore adjacent said cylindrical cavity closed end, an upper end of said slit being open and extending through said flange;

said mold carrier comprising a base member including a conically shaped cavity having a top opening for receiving said flexible mold form, the base member cavity being shaped to receive the exterior surface of said flexible mold form and constrict said longitudinal slit so as to seal said flexible mold form, the base member cavity having another opening at the opposite end thereof from said top opening;

said exterior surface of said flexible mold wall portion defining a conical surface of revolution about said longitudinal axis, the conical surface having an included angle of 16 degrees; and

said flexible mold form when received in said base member cavity extending partially through said another opening of said base member cavity with the closed end of the mold form cylindrical cavity being spaced below said another opening of said base member cavity.

5,067,888

APPARATUS FOR SHAPING A TUBULAR PREFORM INTO A HOLLOW BODY

Nilsson Torsten, Löddeköpinge, Sweden, assignor to Petainer S.A., Neuchatel, Switzerland

Continuation of Ser. No. 334,159, Apr. 6, 1989, abandoned, which is a division of Ser. No. 902,456, Aug. 14, 1986, Pat. No. 4,927,591. This application Jul. 3, 1990, Ser. No. 547,375

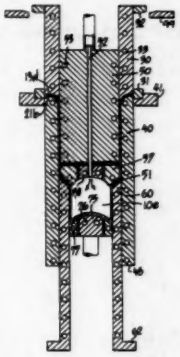
Claims priority, application Sweden, Dec. 14, 1984, 8406373

Int. Cl.[5] B29C *53/08, 55/22, 57/00*

U.S. Cl. 425—387.1 **27 Claims**

19. Apparatus for shaping a substantially tubular preform of deformable plastic material into a hollow body, the tubular preform having a closed bottom, an open mouth and a tubular wall between the bottom and the mouth, said apparatus comprising: a mandrel positioned at the open mouth of the tubular preform, the mandrel having an outer diameter which is greater than the inner diameter of the tubular preform, means for clamping said preform at said open mouth including mechanical clamping devices, means for relatively displacing said mandrel and said mechanical clamping devices for causing said mandrel to move into said tubular preform and progressively expand the wall of the preform circumferentially while said open mouth remains clamped by said mechanical clamping devices, and a sleeve surrounding and supporting the preform therewithin, said sleeve being substantially immovable relative to the mandrel, said sleeve and mandrel forming a gap through which the preform passes as the mandrel moves into the pre-

form, said gap being dimensioned so that as the wall of the preform passes through said gap, said wall is stretched on and



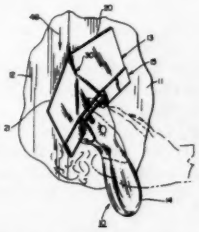
expanded by said mandrel and is out of contact with said sleeve.

5,067,889

SEAM KNIFE FOR DRY WALL

Robert R. Humiston, 134 Woodside La., Liverpool, N.Y. 13090

Filed Aug. 27, 1990, Ser. No. 573,252
Int. Cl.[5] B05C *17/10*
U.S. Cl. 425—458 5 Claims



1. A dry wall tool for closing wide angle shallow corners at a joint between two abutting sheets of dry wall that includes,

a thin flexible blade having a front face and a back face,

said blade further having a linear top edge, two opposed side edges, and a pair of angularly disposed bottom edges that meet at the central axis of the blade to form a point which has an included angle of between 140° and 160°,

said blade being bent from the back face toward the front face along a Y-shaped bend line to form a pair of angularly offset wings,

said bend line having a center leg lying upon the central axis of the blade and extending upwardly from said point to about the mid-region of the blade and a pair of outwardly diverging arms that extend upwardly toward the top edge of the blade, said wings having an interior angle of between 140° and 160°, and

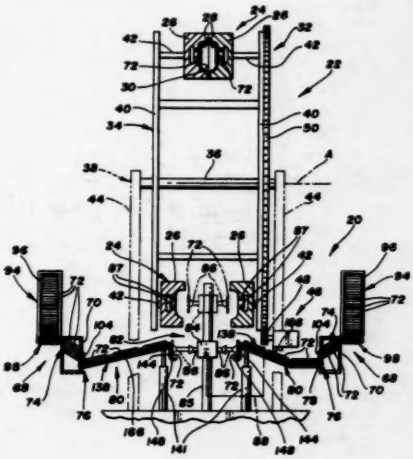
a handle secured to the blade in the region between the upraised arms of said bend lines, said handle extending outwardly beyond the top edge of the blade to provide a hand grip for the tool.

5,067,890

IN-MOLD LABEL SUPPLY SYSTEM FOR PLASTIC BLOW MOLDING MACHINE

Richard L. Dunlap, Cairo, and Edward L. Sanford, Lima, both of Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Nov. 8, 1990, Ser. No. 611,959
Int. Cl.[5] B29C *49/24*
U.S. Cl. 425—504 16 Claims



1. An in-mold label supply system for a plastic blow molding machine including at least one mold having a pair of mold portions which have associated cavity sections and are movable toward and away from each other between an open position where the mold portions are spaced from each other and a closed position where the cavity sections define an enclosed cavity in which the blow molding is performed, the supply system comprising:

a hopper assembly including a feed hopper for positioning discrete sheet-like labels in a vertical feed stack, the hopper assembly also including a storage hopper for storing a supply of the discrete sheet-like labels in a vertical storage stack, and the hopper assembly including a transfer device that transfers labels from the bottom of the vertical storage stack to the top of the feed stack;

a feeder including a feed roller that selectively grips the lowermost label of the feed stack to provide delivery thereof from the feed stack with the next higher label remaining in the feed stack, and the feeder also including a gate that is spaced from the feed roller a distance just greater than the label thickness so as to permit only the lowermost label to be moved from the feed stack by the feed roller;

a source of vacuum and valve means for selectively drawing a vacuum at the feed roller to provide gripping of the lowermost label of the feed stack by the feed roller for movement of the gripped label under the gate and for thereafter terminating the vacuum at the feed roller;

a conveyor for conveying the label from the feed roller to the blow molding machine; and

a label dispenser that transfers the label from the conveyor to the mold for placement within the cavity section of one mold portion with the mold portions in the open position to provide in-mold labeling prior to closing of the mold portions for blow molding that secures the label to the blow molded product.

5,067,891

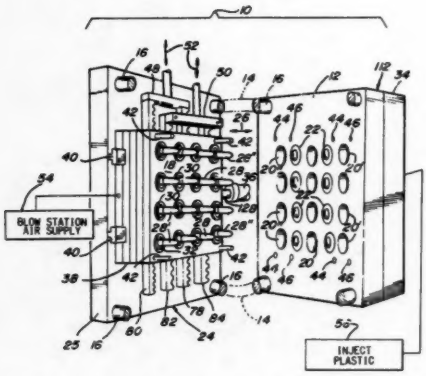
INJECTION BLOW MOLDING APPARATUS

Randall K. Julian, and Edward Luker, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Continuation of Ser. No. 468,683, Jan. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 439,259, Nov. 20, 1989. This application Apr. 19, 1991, Ser. No. 687,220

Int. Cl.[5] B29C *49/06*

U.S. Cl. 425—533 14 Claims



1. Injection-blow molding apparatus for forming containers with restricted necks comprising, in combination:

a one-piece circumferentially continuous injection mold open at one end and having a longitudinally extending axis;

an axially opening blow mold associated with an adjacent to said injection mold, said blow mold including a circumferentially continuous body portion open at one end and having a longitudinally extending axis and a circumferentially continuous shoulder forming portion having a longitudinally extending axis aligned with the longitudinally extending axis of said body portion;

a core having a longitudinally extending axis mounted for relative movement between and into and out of said injection mold and blow mold portions along their respective longitudinally extending axes between an open and a closed position;

a neck forming sleeve concentrically located around said core, said neck forming sleeve having a longitudinally extending axis;

positioning means for moving said core and sleeve between said open and closed positions relative to said injection mold to form a parison and for moving said core and sleeve with a parison and said shoulder forming portion between said open and closed positions relative to and for registry with said body forming portion to blow a container in said blow mold;

transfer means for moving said core and neck forming sleeve in a direction transverse to said axes of said core and neck forming sleeve for alternate alignment of said axes of said core and neck forming sleeve with the longitudinally extending axes of said injection mold and said blow mold portions; and

separating means for releasing said neck forming sleeve and ejecting a finished container from said core in a direction parallel to said core.

5,067,892

EJECTION DEVICE FOR EJECTING A WORKPIECE FROM A DIE IN A FORMING PRESS

Oskar Rahn, Göppingen, and Günter Riedisser, Eislingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

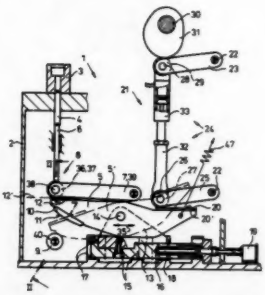
PCT No. PCT/DE89/00107, § 371 Date Jul. 13, 1990, § 102(e) Date Jul. 13, 1990

PCT Filed Feb. 24, 1989, Ser. No. 432,723

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3806352

Int. Cl.[5] B29C *45/40*

U.S. Cl. 425—556 11 Claims



1. An ejection device for ejecting a workpiece from a die in a forming press, said ejection device comprising:

an ejector slide;

a double armed ejector lever having a drive side arm which is driven by driving rods moved in time with the formation of the workpiece, said drive side arm forming a drive side working plane, and an ejector side arm which acts upon said ejector slide, said ejector side arm forming an ejector side take off plane;

a shiftable bearing moveable in a shifting plane and about which the double arm ejector pivots;

adjusting means for changing an ejector lift of the ejection lever, a transmission ratio of the ejector lever being changeable by adjusting a position of the shiftable bearing in the shifting plane; and

a support bearing for supporting the ejector side arm;

wherein the drive side working plane and the ejector side take off plane extend in parallel with respect to the shifting plane when the ejector lever is moved into an ejector position; and

wherein, for compensating different ejector lifts, the ejector lever, for each transmission ratio, in an area between the take off plane and the support bearing, has a different width, the width being determined as a function of a distance of the take off plane to the bearing minus a length of the ejector lift when the ejector lever is in the ejector position.

5,067,893

INJECTION MOLDING APPARATUS WITH SHUT OFF VALVE PIN ACTUATION SYSTEM

Jesus M. Osuna-Diaz, 2365 Avon Industrial Dr., Rochester Hills, Mich. 48309

Filed Jun. 15, 1990, Ser. No. 538,523

Int. Cl.[5] B29C *45/23*

U.S. Cl. 425—564 7 Claims

1. An injecting molding apparatus including an injection nozzle having a gate through which melt is injected into a mold cavity, an actuation system for a shut off valve pin, said valve pin having a tapered tip disposed within the gate of said injection nozzle, said actuation system comprising:

a first gear rack connected to said valve pin to extend upwardly therefrom;

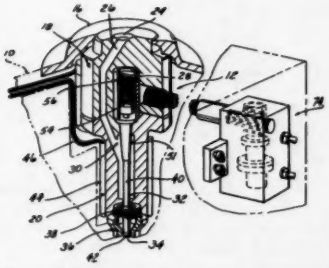
a rotatably mounted first pinion gear meshing with said first gear rack;

a power cylinder including a cylinder housing, and a piston movably disposed in a bore formed in said cylinder housing;

a second gear rack connected to said piston to be reciprocated by movement of said piston in said bore;

a rotatably mounted second pinion gear in mesh with said second gear rack connected to said piston;

a cross shaft mounted or rotation about an axis extending



through the length of said cross shaft, said cross shaft drivingly connecting said first and second pinion gears to rotate together about said axis of said cross shaft;

means for supplying fluid pressure to said bore to cause said piston to move so as to drive said connected first gear rack, said first and second pinion gears, and said second gear rack connected to said valve pin to move said valve pin to a closed position in said gate; and,

means for selectively allowing adjustment of the angular position of said cylinder housing about an axis aligned with the axis of rotation of said cross shaft to thereby enable adjustment of said closed position of said valve pin in said gate.

5,067,894

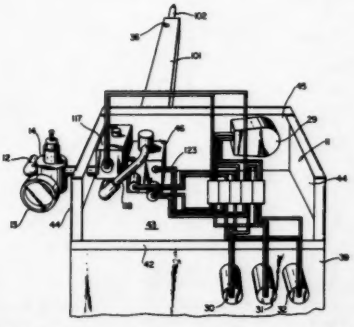
OIL BURNER ASSEMBLY

Glenn Bender, Princeton, Mo., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.

Filed Nov. 8, 1989, Ser. No. 433,230

Int. Cl.[5] F23D *11/44*

U.S. Cl. 431—208 **6 Claims**



1. An oil burner assembly for burning waste oil fuel, comprising a waste oil burner subassembly including an elongated preheating block portion and a generally box-shaped control housing portion secured thereto, means for removably mounting said burner subassembly on a combustion chamber wall with the preheating block portion protruding through said wall and the control housing portion disposed outwardly adjacent the wall, the preheating block being an elongated metal block of rectangular cross-section having a rearward end portion and a front end portion, an air/waste oil burner nozzle carried by said front end portion, said elongated block having first and second longitudinally elongated bores extending in transversely spaced parallelism throughout their length substantially coextensively along their entire length, first conduit means in said rearward end portion for conducting waste oil fuel to the first bore, a transverse connecting bore interconnecting the first and second bores at said front end portion whereby waste oil fuel supplied to said first bore passes forwardly through the length thereof and returns along the length of said second bore to said rearward end portion, second conduit means including an exit bore portion communicating said second bore at said rearward end portion to a solenoid valve in said control housing for conducting the waste oil fuel from the rearward end portion of the second bore to said solenoid valve and including a return conduit portion for returning the waste oil fuel to said block adjacent said rearward end, third, fourth and fifth longitudinal bores in said block paralleling said first and second bores and spanning the length of the block in transversely spaced parallelism with each other throughout their length, connecting bore means communicating said return conduit portion to said third bore, the third bore terminating in a first opening in said front end portion, an elongated electric heater in said fourth bore for heating said block, air conduit means coupled to said fifth bore at the rearward end portion of said block, said fifth bore terminating in a second opening in said front end portion, and said nozzle having means for providing fluid communication with both said first and second openings.

5,067,895

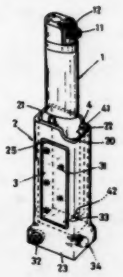
LIGHTER-ACTUATED BINGO MEANS

Jack Chuang, and Tsung-Ping Lin, both of P.O. Box 55-1670, Taipei, Taiwan

Filed Sep. 4, 1990, Ser. No. 577,215

Int. Cl.[5] F23Q *1/00*; F23D *14/00*

U.S. Cl. 431—253 **1 Claim**



1. A lighter-actuated bingo means comprising:

a gas lighter having a gas lever formed in the gas lighter embedded in a socket of a holder casing;

a lotto flash driver including an integrated circuit formed on an integrated circuit board embedded on a side wall of said holder casing, a plurality of indicator lamps connected to said integrated circuit, a buzzer connected to said integrated circuit, a trigger switch formed on a base plate formed in a bottom portion of said holder casing for triggering the integrated circuit for flashing said lamps and sounding said buzzer, and a power source of batteries for powering said integrated circuit, said lamps and said buzzer; and

a trigger means formed on a side wall of said holder casing operatively depressed by said gas lever of said gas lighter

to close said trigger switch of said flash driver for flashing the lamps and sounding the buzzer,

the improvement which comprises:

said trigger means including a slide plate slidably mounted in a longitudinal groove formed in a side wall of said holder casing, an upper bending portion formed on an upper portion of said slide plate normally protruding upwardly above an opening edge formed on an upper portion of said casing and bent inwardly under said gas lever to be operatively depressed by said lever, and a lower bending portion formed on a lower portion of said slide plate and bent inwardly to be normally resiliently urged upwardly by a spring contactor of said trigger switch, said spring contactor of said trigger switch upwardly urged by a tensioning spring to urge said slide plate upwardly to be operatively depressed by said gas lever.

5,067,896

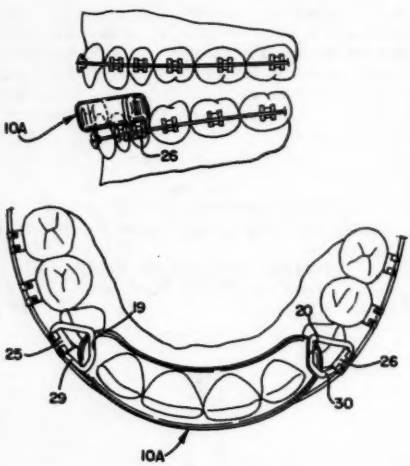
ORTHODONTIC APPLIANCE

Marcel Korn, 328 Newberry St., Boston, Mass. 02115

Filed Apr. 24, 1991, Ser. No. 690,594

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—6 **14 Claims**



1. A method of making a custom-fitted resilient orthodontic appliance for attachment to the anterior of the mandibular arch or the maxillary arch anteriors and coacting with the opposed anteriors when the jaws are in closed position to positively position the opposing dental arches relative to each other, said method comprising the steps of providing an arcuately shaped plastic blank having a generally rectangular cross section and means at the ends for assisting the attachment to one of the arches, said blank having upper and lower substantially flat surfaces and being of a thermoplastic material that is formable when softened by heat and resilient when at normal room and mouth temperatures, heating the blank to soften it to facilitate the impression of tooth sockets in the upper and lower surfaces of the blank, placing the softened blank in the mouth of a patient so that the upper and lower teeth can engage the upper and lower surfaces of the blank, closing the jaws of the patient into the desired jaw relationship to form an impression of the teeth and define tooth sockets for the upper and lower anterior teeth in the upper and lower sides of the blank, allowing the blank to remain in the mouth under pressure of the teeth until the impression of the teeth is set in the blank, removing the formed blank from the patient's mouth, and further cooling the blank so that the impression of the teeth is completely set and the blank is transformed into an appliance for positively positioning the jaws completely relative to each other when the appliance is worn by the patient.

5,067,897

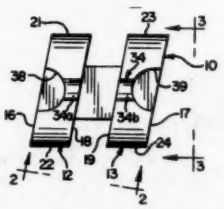
TWIN TIE WING BRACKET

Lee H. Tuneberg, Sheboygan, Wis., assignor to American Orthodontics Corporation, Sheboygan, Wis.

Filed Apr. 24, 1990, Ser. No. 513,607

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—8 **18 Claims**



1. A twin tie-wing orthodontic bracket comprising a base having an attachment face for mounting on a tooth, said bracket having a front profile and a side profile, a pair of tie wings extending from the base, said tie wings being in substantially parallel relation, and a rectangular in form archwire slot extending through both tie wings and adapted to receive an archwire to control precise tooth position, said tie wings having upper and lower tie-wing tips of substantially the same size, and cutouts in the tie wings and the archwire slot at the opposite ends of the archwire slot at the buccolabial face of the bracket to increase the interbracket distance with a like bracket on an adjacent tooth such as to increase the range of an archwire in the archwire slots of the brackets and decrease the forces produced by the archwire.

5,067,898

EXTERNAL FIXING DEVICE FOR BONE SURGERY

Georges E. Dury, Avenue Franklin Roosevelt 141, 1050 Brussels, Belgium

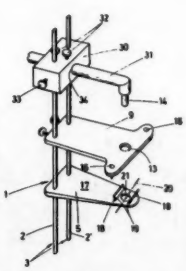
PCT No. PCT/BE88/00012, § 371 Date Nov. 13, 1989, § 102(e) Date Nov. 13, 1989, PCT Pub. No. WO88/08691, PCT Pub. Date Nov. 17, 1988

PCT Filed Apr. 28, 1988, Ser. No. 439,367

Claims priority, application Belgium, May 14, 1987, 08700535

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—75 **6 Claims**



1. An external fixing device for carrying out trepanations allowing implants to be positioned during dento-maxillo-facial bone surgery,

said device comprising:

at least one rigid rod having an extremity serving as a handle for said device; each said at least one rod having a respective longitudinally extensive portion having a constant transverse cross-sectional size and shape and a longitudinal axis;

a spacer element fixed to each said at least one rod at a given distance from the respective said extremity, extending substantially perpendicularly to said longitudinal axis and arranged to bear upon a first face of a bone which is to be trepanned;

at least one movable element axially slidably mounted on said portion of each said at least one rod so as to be positionable to bear upon an opposite, second face of said bone;

means defining an opening through said at least one movable element, along an axis that is substantially parallel to said longitudinal axis, said opening being arranged to allow passage therethrough of a portion of a trepanation tool for accessing said bone; and

means for selectively immobilizing said at least one movable element to said portion of each said at least one rod at a selected position relative to said spacer element;

a movable support for a trepanation tool, said movable support being axially slidably mounted on said portion of each said at least one rod on an axially opposite side of said at least one movable element from said spacer element;

means for securing to said movable support a trepanation tool having a head coaxially aligned with said axis of said opening through said at least one movable element; and

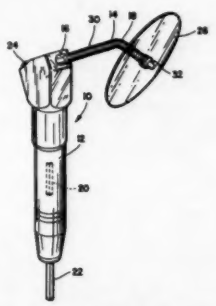
means for selectively immobilizing said movable support to said portion of each said at least one rod at a selected position relative to said at least one movable element.

5,067,899

AIR-WATER DENTAL SYRINGE WITH PROTECTIVE BARRIER

Richard C. Paschal, 6608 Jocelyn Hollow Rd., Nashville, Tenn. 37205

Filed Jan. 7, 1991, Ser. No. 638,196
Int. Cl.[5] A61G *17/02*
U.S. Cl. 433—80 **9 Claims**



1. In an air-water syringe having a body portion adapted to be hand-held, a nozzle portion connected to and extending away from said body portion, at least one passageway extending through such body portion and such nozzle portion to permit the flow of water or air therethrough, and control means for regulating the flow of water or air through said passageway, the improvement comprising:

a) a protective barrier plate dimensioned to cover the open mouth of a dental patient; and

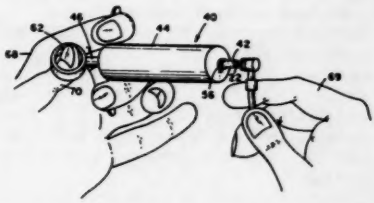
b) means for mounting said protective barrier plate on said nozzle portion of said syringe said mounting means permitting selective relative linear movement of said protective barrier plate along the extending length of said nozzle portion and permitting selective relative angular movement of said protective barrier plate with respect to said nozzle portion, whereby said syringe can be manipulated through a wide range of positions within the mouth of a dental patient while said protective barrier plate is in place covering the mouth of said dental patient.

5,067,900

APPARATUS AND METHOD FOR APPLYING GUTTA-PERCHA TO A CARRIER

John T. McSpadden, 6918 Shallowford Rd., Chattanooga, Tenn. 37421

Filed Jan. 8, 1991, Ser. No. 638,685
Int. Cl.[5] A61G *5/02*
U.S. Cl. 433—81 **15 Claims**



1. A method of applying gutta-percha to a shank-like carrier with which the gutta-percha is introduced into an extirpated root canal for obturating the root canal, said method comprising the steps of:

providing a syringe-like apparatus having a hollow barrel containing an amount of gutta-percha and a plunger fitted within the barrel for sliding movement relative to and along the length of the barrel, one end of the barrel having a discharge opening toward which the gutta-percha is urged when the plunger is moved through the barrel and toward the discharge opening;

heating the apparatus to soften the gutta-percha contained therein;

positioning one end of the shank-like carrier through the discharge opening; and

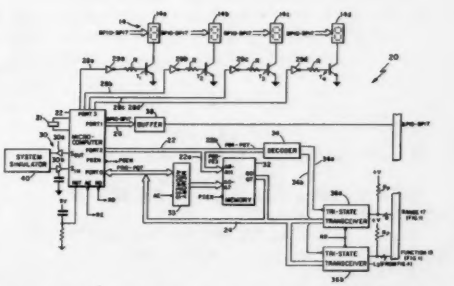
moving the plunger through the barrel to dispense the softened gutta-percha through the discharge opening and withdrawing the carrier from the discharge opening so that gutta-percha dispensed through the discharge opening coats the surface of the carrier.

5,067,901

SIMULATED MULTIMETER

Donald S. Fordham, 6888 Granero, El Paso, Tex. 79912; Richard A. Petersen, 5436 Van Horn, El Paso, Tex. 79924, and Charles E. Gorbet, 3356 Menard La., El Paso, Tex. 79936

Filed Nov. 14, 1989, Ser. No. 436,527
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—224 **7 Claims**



1. A simulated multimeter having a function switch and a range switch, said simulated multimeter comprising:

means fed by digital display data signals for providing a numeric display corresponding to a number represented by said digital display data signals; and

controller means, fed by a plurality of switch signals which correspond to the selected settings of said function switch

and said range switch and fed by an input data stream corresponding to a value of a simulated electrical parameter which represents a value of an actual electrical parameter without said actual electrical parameter being present, wherein said value of the simulated electrical parameter is related to said plurality of switch signals, for converting said input data stream into digital display data signals.

7. A simulated multimeter comprising:

a function switch for selecting one of a plurality of electrical parameter settings;

a range switch for selecting one of a plurality of scale factor settings associated with a corresponding one of the electrical parameter settings;

a digital display fed by digital display data signals corresponding to a number represented by said digital display data signals;

controller means, fed by a first data stream corresponding to said electrical parameter settings and said electrical scale factor settings from said function switch and said range switch and fed by a second data stream corresponding to simulated electrical parameter values related to said plurality of electrical parameter and scale factor settings, for converting said second data stream into the digital display data signals, said controller means comprising:

(a) a microcomputer comprising:

(i) a full duplex serial channel means for providing an output serial signal path fed by said first data stream related to said plurality of electrical parameter and scale factor settings and for providing an input serial signal path fed by said second data stream provided by a system simulator and related to said input data stream;

(ii) a first parallel interface means for providing a control signal; and

(iii) a second parallel interface means for providing a second parallel signal path fed by said electrical parameter and scale factor settings;

(b) a pair of buffer devices coupled to said second parallel interface means for transferring one of said electrical parameter and scaler factor settings to said microcomputer; and

(c) a decoder fed by said control signal from said first parallel interface means to provide signals to select one of said buffer devices along a third signal path;

an external network coupled to said system simulator, wherein said network has a plurality of selectable circuit paths; and

a pair of test leads for selecting one of said plurality of selectable circuit paths, wherein said system simulator includes means for providing said first data stream related to a circuit path selected by said pair of test leads.

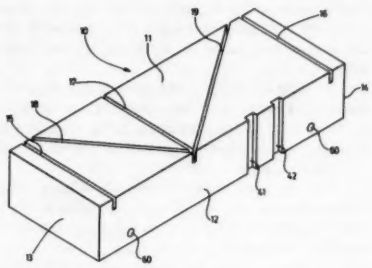
5,067,902

MULTIFUNCTIONAL BLOCK AND KIT FOR SCIENCE INSTRUCTION

Thomas G. Phillips, R. R. #3, P. O. Box 577, Arthur, Ontario, Canada N0G 1AO

Filed Jan. 12, 1990, Ser. No. 464,227
Int. Cl.[5] G09B *23/00*
U.S. Cl. 434—276 **2 Claims**

1. A science kit comprising a multifunctional support means consisting of a block having a plurality of slots and holes in its top, bottom, front, back and side walls, a plurality of ancillary components selected from the group consisting of gears, mirrors, ramps, dowelling, magnets, metal rods, weights, washers, balloons, paper clips, string, tape, tacks, rubber bands, straws, pins, moulds and cloth particles and activity cards containing instructions for setting up and conducting experiments utilizing the multifunctional support means and the ancillary components wherein the sots and holes in the block are of various



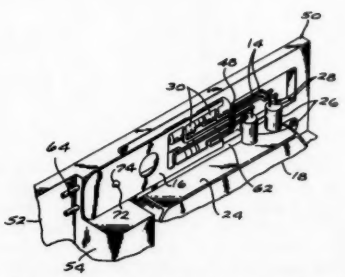
sizes and shapes for retaining and supporting one or more of the ancillary components.

5,067,903

RIBBON CONDUCTOR SET AND METHOD

Andrew J. Szyszkowski, Canyon Country, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Nov. 20, 1989, Ser. No. 439,070
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—55 **6 Claims**



1. A ribbon conductor set for interconnecting electrical components in an implantable medical device, said ribbon conductor set comprising:

a plurality of conductor ribbons formed as a set in a predetermined number, shape, and spacing;

a support frame including means for removably supporting said conductor ribbons as a group,

said conductor ribbons and said support frame being integrally formed from common sheet stock of a selected conductive material; and

spacer means for connection to said conductor ribbons to maintain a selected spacing therebetween, wherein said spacer means comprises an epoxy bead.

5,067,904

IC SOCKET

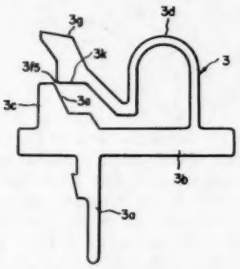
Shigeru Takeuchi, Takasaki; Takayuki Murayama; Motokuni Horiguchi, both of Kodaira, and Masami Hukunaga, Kawaguchi, all of Japan, assignors to Kabushiki Kaisha Hitachi Seisakusho, Tokyo; Hitachi Micro Computor Engineering Kabushiki Kaisha, Kodaira and Enplas Corporation, Namiki Kawa Guchi, all of, Japan

Continuation of Ser. No. 139,347, Dec. 29, 1987, abandoned. This application Oct. 3, 1990, Ser. No. 593,305

Claims priority, application Japan, Dec. 29, 1986, 61-20011; May 1, 1987, 62-109294

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—73 **6 Claims**



1. An IC socket having a socket body, a cover and contact for testing an IC package having lead terminals, that make point to point contact when pressed down on contact pins by closing said cover, said contact pins comprising:

a base;

a connecting terminal extending beneath said base;

a first contacting piece extending upward from said base;

a single semi-circular spring extending upward from said base;

a second contacting piece constructed to rpovide an end to be pressed down by the end of a terminal fo said IC package, said second contacting piece extending outward from said semi-circular spring toward said first contacting piece; said first and second contacting pieces having first and second contacting faces in close proximity but spaced from each other when said semi-circular spring is in a relaxed condition; said first and secone contacting pieces constructed and arranged to provide a short linear connecting path between said connecting terminal and said second contacting piece when said contacting faces are in contact; at least one of said contacting faces being at oblique angle to the base; whereby when the end of a lead terminal of said IC package presses down on an outer end of said second contacting piece; said first and second faces come into sliding contact.

5,067,905

ELECTRIC CONNECTION BOX

Etsuji Matsumoto; Mamoru Araki, and Keiichi Ozaki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 534,564, Jun. 7, 1990, Pat. No. 5,011,417. This application Feb. 4, 1991, Ser. No. 650,261

Claims priority, application Japan, Jun. 9, 1989, 1-145302; Feb. 20, 1990, 2-37440

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—76 **1 Claim**

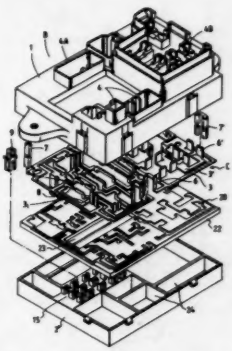
1. In an electric connection box comprising a housing, a box-shaped body, a plurality of bus bars having integral upstanding tabs accommodated within said body, said tabs passing through a tab insertion hole in a wall of said body and extending into said housing outside of said body so as to form an insertion portion for an electrical connector, the improvement comprising:

bridge-like press-connecting pieces, formed respectively on a portion of said plurality of bus bars, and disposed in planes perpendicular to a circuit surface of said bus bars;

a plurality of press-connecting terminals, each having a base plate portion, tabs formed on one side of said base plate portion, and a bus bar-pressing connecting portion formed on the other side of said base plate portion and having a U-shaped slot;

terminal holders for said press-connecting terminals, said terminal holders being formed on an inner surface of said body and comprising a pair of bus bar guide walls each having a bus bar guide groove; and

an insulative board having bus bar-mounting grooves arranged in a pattern corresponding to a pattern of arrangement of said plurality of bus bars, and having through holes for said terminal holders;



said base plate portion being fixed by passing each of said tabs of said press-connecting terminal into said housing through a tab insertion hole of said terminal holder;

said electric connection box further including a bus bar circuit board, said plurality of bus bars being mounted fixedly in said bus bar-mounting grooves of said insulative board, said bus bar circuit board being placed on the inner surface of said body, so that said terminal holder is projected through said through hole; and

wherein said press-connecting piece is inserted into said guide grooves in said bus bar guide walls, and is press-fitted in and connected to said U-shaped slots of said press-connecting terminal.

5,067,906

ELECTRIC CURRENT DISTRIBUTION APPARATUS

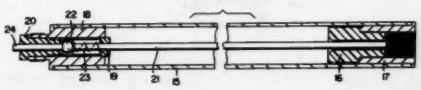
Terence A. Woodgate, London, England, assignor to GTE Rotaflex Limited, London, England

PCT No. PCT/GB89/00665, § 371 Date Dec. 7, 1990, § 102(e) Date Dec. 7, 1990, PCT Pub. No. WO89/12918, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 15, 1989, Ser. No. 623,413

Int. Cl.[5] H01R *17/04*

U.S. Cl. 439—115 **25 Claims**



1. An electrical cable consisting of an elongate rigid rod and comprising inner and outer coaxial conductors and complementary coupling means comprising male and female screw-threaded couplings at the opposite ends thereof, thereby to-enable the connector to be connected releasably but securely end-to-end with another connector of substantially identical

form to construct a rigid coaxial connector assembly with electrical continuity of the inner and outer conductors being maintained over the length of the assembly, the inner conductor including at one end of the connector a contact portion retractable axially relative to the outer conductor against a spring force exerted thereon, whereby to ensure firm axial abutment of said contact portion with the inner conductor of another connector coupled to said one end of the connector.

5,067,907

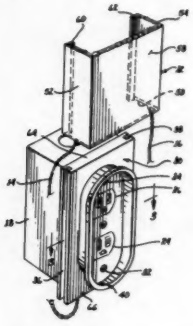
COVER AND SHEATH FOR ELECTRICAL OUTLETS

Michael J. Shotey, 7733 E. Cypress, Scottsdale, Ariz. 85257

Division of Ser. No. 596,777, Oct. 12, 1990. This application Feb. 19, 1991, Ser. No. 657,494

Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—135 **17 Claims**



1. Apparatus for protecting an electrical socket and an electrical plug plugged thereinto, said apparatus comprising in combination:

a) a face plate surrounding the electrical socket, said face plate including a pair of opposed grooves disposed on opposed sides of the electrical socket;

b) a box having an open bottom side, a pair of opposed sidewalls, a top wall and a front wall for covering the electrical socket, each of said side walls including a tongue for slidably engaging one of said grooves to permit downward sliding of said box with respect to said face plate to cover the electrical socket and upward sliding of said box with respect to said face plate to uncover the electrical socket;

c) a continuous wall extending from said face plate and about the electrical outlet, said wall including an outwardly facing channel; and

d) a sheath for enclosing the electrical plug plugged into the electrical socket, said sheath including means for securing one end of said sheath about said wall and further means for securing the other end of said sheath about an electrical conductor extending from the electrical plug.

5,067,908

SELF-ALIGNING CONNECTOR

Lloyd A. Guth, San Diego, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Nov. 19, 1990, Ser. No. 615,521

Int. Cl.[5] H01R *13/629*

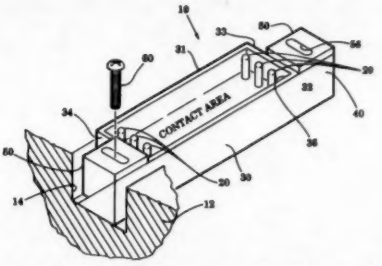
U.S. Cl. 439—248 **5 Claims**

1. A self-aligning connector comprising:

an elongated connector body having a predetermined length, a top surface, a horizontally oriented bottom surface, a front wall, a vertically orientated rear wall and laterally spaced end walls;

a cutout portion of said connector body enclosing electrical contacts, said cutout portion extending between said top and bottom surfaces;

a foot portion extending longitudinally from each of the end walls of said connector body each of said foot portions having an end wall surface, a horizontally orientated bottom surface, a vertically orientated rear wall, and an inclined front wall having an acute angle, a vertically oriented elongated horizontally bore hole extends from said inclined front wall to said bottom surface; and



a wedge block detachably connected to each of said foot portions, each of said wedge blocks having a top surface and an inclined bottom wedge surface that mates with the inclined front wall of a respective said foot portion, an elongated slot extending through each of said wedge blocks from their top surface to their inclined bottom wedge surface.

5,067,909

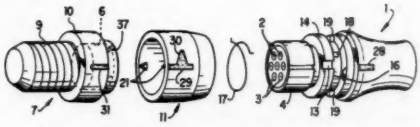
LOCKING MULTIPLE CONDUCTOR ELECTRICAL CONNECTOR

Christian D. Behning, Plymouth, Mass., assignor to Alden Products Company, Brockton, Mass.

Filed Feb. 25, 1991, Ser. No. 659,898

Int. Cl.[5] H01R *4/54*

U.S. Cl. 439—315 **15 Claims**



1. An electrical connector comprising:

first and second tubular connector bodies having telescopingly engaged body portions and axially mating electrical contacts;

an annular collar encircling the telescoping body portions and rotatively held on the first body;

a spring inside the collar, the ends of the spring being confined between the first body and the collar so as to yieldingly resist rotation of the collar relatively to the first body;

axially opposed tabs on the collar and second body with opposed flaring cam surfaces cooperatively producing rotation of the collar relative to the second body as the bodies are telescoped to a mated contact position, the cam surfaces guiding the collar tab around the body tab; and

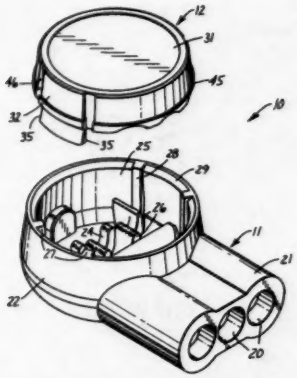
the spring yielding as the collar is rotated by the cam tabs during contact mating, and the spring then rotating the collar tab to a latching position axially behind the body tab locking the connector bodies in mated contact position.

5,067,910

SOLDERLESS ELECTRICAL CONNECTOR

George J. Knox; Daniel F. Cronch, and Martin G. Afflerbaugh, all of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 17, 1991, Ser. No. 642,534
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—402 16 Claims



1. A wire connector for connecting multiple wires comprising;

a base member having a plurality of side-by-side elongate wire-receiving channels having extended surfaces to support a corresponding plurality of wires, said base member and said extended surfaces being formed with at least one groove which extends across said extended surfaces and generally perpendicular to said channels, wall members defining a cavity about said extended surfaces which cavity has an opening spaced from said extended surfaces, said wall members having inner and outer surfaces, said wall members having at least two pair of spaced wall portions, said wall portions extending from said inner surface of said wall members into said cavity and being positioned in relationship to each other to diverge from said opening toward said extended surfaces,

a resilient conductive connecting member comprising a plate which is deeply grooved and adapted to fit within the groove in said base member with a groove in the plate in line with each of said channels, and

a cap supporting said connecting member and shaped to fit in said cavity, said cap comprising an end wall and depending side walls having two legs extending beyond the free edges of said side walls at opposed locations, said connecting member being positioned within said side walls against the interior surface of said end wall, each of said legs being disposed inside said cavity with one leg disposed between each pair of said wall portions, said legs each having side edges which diverge toward the free edge of the legs to fit between and engage opposed sides of said wall portions,

whereby when a force is applied tending to separate the cap from the base the force of said legs against said wall portions tend to compress said legs and separate said wall portions to resist said separation and

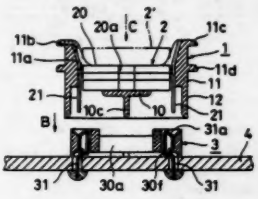
whereby and when sufficient force is applied against said end wall of the cap forcing it in a direction toward said base, said opening in the base member will be forced to expand allowing entry of said cap and connecting member into said cavity such that said connector affords fully effective spring reserve contact with wires disposed in said channels.

5,067,911

IC HOLDER

Toshiro Saeki, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1990, Ser. No. 600,338
Claims priority, application Japan, Oct. 19, 1989, 1-272121
Int. Cl.[5] H01R 23/72; B65D 73/02
U.S. Cl. 439—526 11 Claims



1. An IC holding device for an IC element to be detachably attached to an IC socket, comprising an IC holder for holding an IC element having two rows of terminal pins to be detachably attached to an IC socket, said IC element having an unassembled state in which the terminal pins in one row are spaced from the terminal pins in the other row a first distance, said IC holder having an upper frame portion having two spaced and opposed side walls joined to two spaced and opposed end walls, said side walls having upper edges and inner surfaces extending from said upper edges, tapered guide grooves on said inner surfaces extending from said upper edges, retaining grooves opening up onto said inner surfaces, said retaining grooves being aligned with and forming continuation of said guide grooves, said guide grooves being tapered to converge inwardly of the IC holder as said retaining grooves are approached, said guide grooves guiding said terminal pins of said IC element into said retaining grooves, said retaining grooves in the inner surface of one side wall being spaced from the retaining grooves in the inner surface of the other side wall a second distance which is less than said first distance such that said terminal pins are frictionally and resiliently retained in said retaining grooves after having been guided into said retaining grooves by said tapered guide grooves, said IC holder having a lower frame portion integral with said upper frame portion, said lower frame portion being fitted to the periphery of an IC socket to which the IC element is detachably attached, said IC holder having an integral lateral plate disposed to restrict the depth of insertion of said IC element into said IC holder, indicating means on said upper frame portion for indicating the correctly oriented direction of insertion of said IC element into said IC holder, and restricting means on said IC holder for restricting the fitting of said IC holder to said IC socket to a correctly oriented fitting such that said IC holder can only be fitted to said IC socket when said IC holder is correctly oriented relative to said IC socket.

5,067,912

SUBASSEMBLY FOR A MICROWAVE CONNECTOR AND METHOD FOR MAKING IT

Wayne F. Bickford, East Hampstead, N.H., and Kenneth L. Smith, East Machias, Me., assignors to M/A-Com Adams-Russell, Inc., Burlington, Mass.

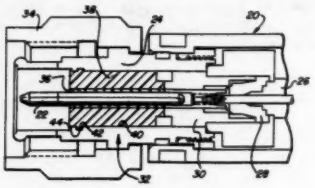
Filed Nov. 3, 1987, Ser. No. 116,473
Int. Cl.[5] H01R 17/18
U.S. Cl. 439—578 11 Claims

1. A method for making a conductor subassembly comprising the steps of:

forming a preassembly of a metal conductor placed adjacent a first layer of a first fluoroplastic material and with the first layer placed adjacent a second layer formed of a second fluoroplastic material; said first fluoroplastic material being more readily bondable to said conductor than

the second fluoroplastic material and being bondable to said second fluoroplastic material; and

applying heat and pressure to the preassembled conductor,



and the first and second layer in a sufficient amount and for a sufficient time to bond the conductor to the first layer and the first layer to the second layer to form an integral subassembly.

5,067,913

ELECTRICAL CONNECTOR

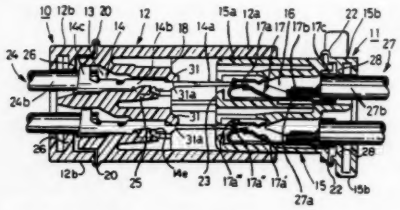
Tetsuya Sagawa, Yamato, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 18, 1990, Ser. No. 525,524

Claims priority, application Japan, Sep. 20, 1988, 63-235347

Int. Cl.[5] H01R *13/40*

U.S. Cl. 439—595 **3 Claims**



1. An electrical connector, comprising:

a dielectric housing having a first section including contact-receiving passageways and a second section defining a mating section for matable engagement with a complementary electrical connector having receptacle contacts secured therein, said second section extending forwardly from a front surface at which front ends of the contact-receiving passageways are located;

tab contacts disposed in said contact-receiving passageways;

securing means provided by said housing and said tab contacts whereby said tab contacts are secured in said contact-receiving passageways;

tab sections of said tab contacts extending beyond said front surface and along said mating section; and

restraining sections on said front surface adjacent the front ends of the contact-receiving passageways and extending in a radial direction of said contact-receiving passageways for engaging along top surfaces of said tab sections adjacent the base portions thereof thereby aligning the tab sections for matable engagement with the receptacle contacts when said mating section matably engages the complementary electrical connector.

5,067,914

MULTI-POLE CONNECTOR HAVING A CENTERING STRIP WITH A SHIELD

Peter Seidel, Groebenzell, and Karl Zell, Niederpoecking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

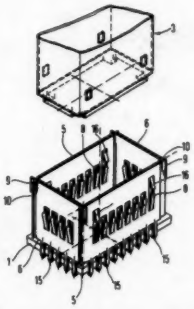
Continuation of Ser. No. 521,457, May 10, 1990, abandoned.

This application Apr. 12, 1991, Ser. No. 684,479

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921430

Int. Cl.[5] H01R *13/648*

U.S. Cl. 439—609 **2 Claims**



1. A multi-pole plug apparatus for plugging to a circuitboard which includes a plurality of spaced contact blades extending therefrom and a plurality of spaced aligned openings therethrough, comprising:

a rectangular plug section including a housing comprising a plurality of exterior housing walls, a rectangular centering plate connected to said housing walls and terminating said plug section, said centering plate including a plurality of openings therein each including a tapered entrance and defining a respective contact passage, a plurality of spacers carried by said centering plate and each aligned with a respective opening and including wall sections defining a spacer passage at an end wall terminating the spacer passage at an end opposite the respective opening, said passages receiving respective ones of said contact blades upon plugging, said contact blades contacting said end walls to limit plugging of said plug section and spacing said plug section a predetermined distance from the circuitboard;

a shield directly connected to, carried by and extending from the circuitboard, said shield including first and second longitudinal metallic spring strips and first and second transverse metallic spring strips each connected to said first and second longitudinal metallic spring strips to define a rectangular cavity for receiving and holding aid plug section.

said longitudinal metallic spring strips each comprising recesses adjacent their ends,

said transverse metallic spring strips each comprising hook structures including complimental recesses and hooks at their ends, said recesses of said longitudinal and transverse metallic spring strips mating and said hooks of said transverse metallic spring strips overlapping said longitudinal metallic spring strips to connect said metallic spring strips together, and

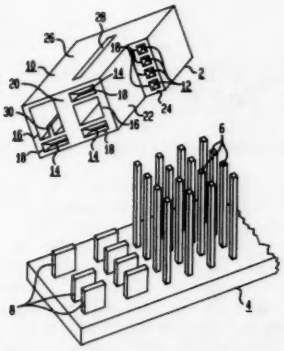
each of said metallic spring strips comprising two layers of sheet metal including a plurality of spring tongues punched out and extending at an angle therefrom to engage the respective exterior walls of said housing of said rectangular plug section, and each of said metallic spring strips comprising a plurality of projections each in the form of a cone, and each of said projections force fit into a respective one of said aligned openings.

5,067,915

PLUG-IN COMPONENT

Fritz Kienast, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 783,499, Oct. 3, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 91,356
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1984, 3438824
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 3 Claims



1. A diode plug-in component for a contact strip, said contact strip having a planar surface defined with two adjacent end portions, one end portion being fitted with at least one flat plug having a flat shape with a lateral width and a height projecting in a vertical direction from said planar surface primarily for forming a stable mechanical connection, and the adjacent other end portion having a plurality of plug contacts arranged in a matrix thereon, said plug contacts having a different shape from said at least one flat plug and projecting in the vertical direction primarily for forming respective electrical connections, said diode plug-in component comprising:

a housing of said diode plug-in component having side walls forming an insulated enclosure and a contact surface adapted for being placed in contact with the contact strip, contact elements in said housing for forming desired connections with the plug contacts of said contact strip, at least one locking flat plug receptacle arranged at one end portion of said contact surface adapted for receiving and locking said at least one flat plug of said contact strip therein, and a plurality of slotted holes arranged at another end portion of said contact surface having openings facing the contact strip adapted for receiving respective ones of said plugs contacts of said contact strip therein; and

a plurality of diodes arranged in said housing and being connected in an electrically conductive fashion with the contact elements to be connected with the plug contacts, and wherein the arrangement of the at least one flat plug receptacle and the slotted holes of said diode plug-in component corresponds with the arrangement of the at least one flat plug and the plug contacts of said contact strip,

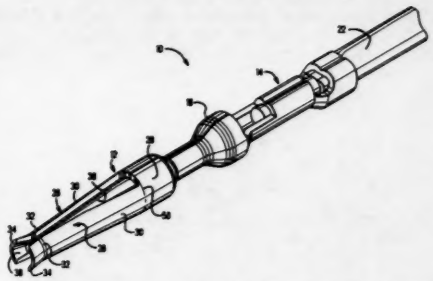
whereby the connection of the at least one flat plug in the locking flat plug receptacle is used primarily to form a stable mechanical connection for said diode plug-in component in conjunction with the connection of the plug contacts in the slotted holes used to form electrical connections, and the diodes are arranged to be self-contained with the contact elements in the housing.

5,067,916

METHOD FOR MAKING AN ELECTRICAL CONTACT

Keith R. Denlinger, Lancaster; Richard W. Gryzbowski, Lebanon, and John M. Myer, Millersville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 12, 1990, Ser. No. 596,274
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—857 2 Claims



1. A method of making an electrical socket contact for either gold plating or tin plating without changing the length of the socket contact, said method comprising the steps of:

blanking out of contact outline comprising a wire barrel at one end and a pair of parallel beams at another end and varying the width of said beams to produce either a high spring rate for tin plating or a low spring rate for gold plating without a change in the length of said beams; and

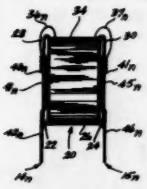
rolling said contact outline into a cylindrical form with said beams defining a socket for receiving a pin.

5,067,917

COMPONENT MOUNTING FRAME

Jerry L. Howard, Marysville, Wash., assignor to Eldec Corporation, Lynnwood, Wash.

Filed Sep. 6, 1989, Ser. No. 404,330
Int. Cl.[5] H01R *13/02*
U.S. Cl. 439—890 27 Claims



1. A frame for holding an electrical component that is to be mounted on a printed circuit board, said frame comprising:

(a) a flat member having at least two hole pairs and folded to form a pocket for holding an electrical component therein, said flat member being further folded to form a first flap adjacent said pocket and having one of said hole pairs located therein and a second flap adjacent said pocket and having another one of said hole pairs located therein; and,

(b) a first frame lead and a second frame lead attached to said flat member, said first frame lead being inserted through said hole pair in said first flap so as to securely attach said first frame lead to said first flap and said second frame lead being inserted through said hole pair in said second flap so as to securely attach said second frame lead to said second flap, said first and second frame leads having first ends that may be connected to lead wires from the electrical component in said pocket and second ends that may be

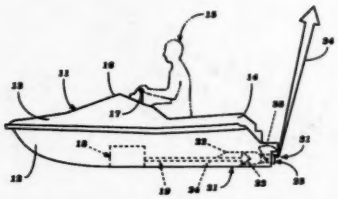
connected to a printed circuit board, such that said first and second frame leads support said frame and the electrical component held in said pocket of said frame.

5,067,918

REVERSE THRUSTER FOR WATER JET PROPULSION

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 18, 1989, Ser. No. 452,699
Claims priority, application Japan, Dec. 19, 1988, 63-321594
Int. Cl.[5] B63H *11/10*
U.S. Cl. 440—39 9 Claims



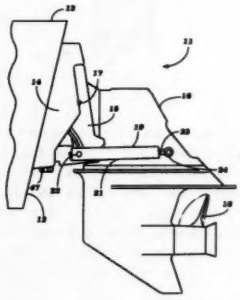
1. A jet propulsion unit for a small watercraft having a discharge nozzle, a flow deflecting device positioned in said discharge nozzle and extending beyond the periphery of said discharge nozzle for deflecting a portion of the water flowing through said discharge nozzle in a generally upward spray to form a rooster tail effect, and a reverse bracket supported for movement from a retracted forward position to an obstructed reverse position wherein said jet propulsion unit effects a reverse thrust, said reverse thrust bucket being formed with a cut away portion to clear said flow directing device when said reverse thrust bucket is in at least one of its positions to permit the generation of said spray when in said one position.

5,067,919

TILTING/TRIMMING SYSTEM FOR MARINE PROPULSION UNIT

Ryozo Okita, Hamamatsu, Japan, assignor to Sanshin Industries Co., Ltd., Hamamatsu, Japan

Filed Oct. 12, 1989, Ser. No. 420,588
Claims priority, application Japan, Oct. 12, 1988, 63-256745
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—61 11 Claims



1. In a hydraulic tilt and trim system for an outboard drive unit mounted on the transom of a marine vessel for tilting movement of the drive unit and movement between a plurality of trim positions, comprising at least one fluid motor connected to said drive unit and said transom, said fluid motor having a cylinder housing and a moveable member defining a pair of fluid chambers, a pump for delivering hydraulic fluid to said fluid motor, and an electric motor for driving said pump, the improvement comprising means for controlling the voltage applied to said motor for selectively effecting quick tilting up movement of the drive unit and slow trimming movement of the drive unit between a plurality of trim positions.

5,067,920

DIVE FLAG LINE DISPENSER APPARATUS

Michael J. Brisky, 9707 S. Gessner, Apt. #701, Houston, Tex. 77071

Filed Mar. 12, 1991, Ser. No. 668,232
Int. Cl.[5] B63B *21/52*
U.S. Cl. 441—25 6 Claims

1. A dive flag line dispenser apparatus comprising, in combination,

a flotation buoy arranged for flotation upon a top surface of a body of water, wherein the flotation buoy is formed of a buoyant material, and

a flexible tether line, the flexible tether line including a forward terminal end mounted to the flotation buoy, and the flexible tether line including a rear terminal end, the rear terminal end rotatably secured within a dispenser unit, and the dispenser unit including a rigid, elongate handle, the handle fixedly mounting a caged head at an upper terminal of the handle, with the caged head coaxially aligned with the handle, and

the caged head including a spool rotatably mounted within the caged head, wherein the spool is coaxially aligned relative to the handle, and

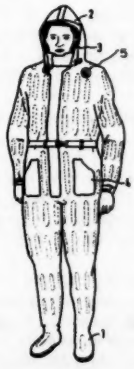
motor means mounted within the handle to effect selective rotation and counter-rotation of the spool.

5,067,921

INFLATABLE IMMERSION SUIT

Eric Bramham, Morpeth, United Kingdom, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Sep. 27, 1989, Ser. No. 413,525
Claims priority, application United Kingdom, Sep. 30, 1988, 8822943
Int. Cl.[5] B63C *9/08*
U.S. Cl. 441—102 6 Claims



1. An inflatable immersion suit comprising:

an inner and an outer layer of an impermeable material, the

inner layer being made of an inherently more elastic material than the outer layer,

a spacing between said inner and outer layers, said spacing forming a sealed compartment that can be inflated in an emergency situation,

an intermediate layer which interconnects the inner and outer layers so that the three layers are fastened together in such a pattern that the intermediate layer divides the spacing into a plurality of separated compartments and that the inner and outer layers are substantially parallel to each other and are not in direct contact with each other, wherein the intermediate layer divides the spacing into two separated compartments which are individually inflatable with a gas, and wherein the intermediate layer is connected to the inner and outer layers by matrices of welding points which are spread in alternating patterns over the surface of the suit such that a welding point between the intermediate layer and one of said inner and outer layers is located in the centre of a square formed by four adjacent welding points between the intermediate layer and the other of said inner and outer layers.

5,067,922

COMBINATION DRINK COOLER AND THROWING TOY

Michael E. McMahon, 1175 Glen Cyn. Rd., Scotts Valley, Calif. 95066

Filed Apr. 19, 1990, Ser. No. 510,967
Int. Cl.[5] A63H *27/00*; B65D *23/08*
U.S. Cl. 446—71 **7 Claims**

1. A combination drink cooler and throwing toy for use as a device for insulating a container of liquid, as well as, a device for use as a throwing toy, comprising:

an open-ended inner cylinder means of an insulating material for insulating a container of liquid from it's surrounding environment, and

an open-ended outer cylinder means for stability in flight, wherein

said inner cylinder being joined about it's outer surface to inside of said outer cylinder, and

a weighted ring means for providing forward mass necessary for aerodynamic flight encircling the forward end of the device sandwiched between said inner cylinder and said outer cylinder.

5,067,923

TRAINING SYSTEM FOR SPINNING OBJECTS BY HAND

Lou de Bourbon, 428 Anacapa St., Santa Barbara, Calif. 93101

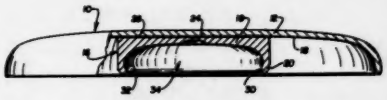
Filed Mar. 26, 1990, Ser. No. 499,002
Int. Cl.[5] A63H *1/00, 27/00*; G09B *19/00*; A63B *65/10*
U.S. Cl. 446—236 **15 Claims**

1. A training system for balancing and spinning an essentially planar object, wherein said system comprises a plurality of interchangeable finger disk members, each removably attachable to said essentially planar object so as to receive a user's finger therein, said system comprising:

each of said plurality of interchangeable finger disk members having a cavity formed therein to receive a finger; wherein

each cavity of said plurality of interchangeable disk members is formed having a different cross-sectional configuration that requires a related skill level in order to use; and wherein

said finger disk members are formed having a mating base surface a wall surface and a rim, wherein said cross-sectional configuration is defined by said wall surface and said rim, whereby a user selectively changes one finger disk member for another so as to choose one member related to his skill level for balancing and spinning an object to which one of said finger disk members is removably attached; and



adhesive means for removably securing one of said finger disk members mating surface to at least one side of a chosen essentially planar object.

5,067,924

DOLL FOR SUMULATING WEIGHT LOSS/GAIN

Beverly L. Munter, 51 Fountain La., Jericho, N.Y. 11753

Filed Oct. 10, 1990, Ser. No. 595,179
Int. Cl.[5] A63H *3/36, 3/12, 13/02*
U.S. Cl. 446—320 **6 Claims**

1. A method for encouraging weight loss in an individual comprising the steps of:

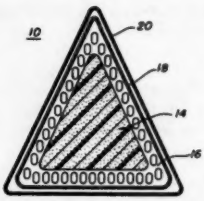
providing a doll's body of the same gender as said individual;

providing said doll with a plurality of layers of simulated skin, each representing a predetermined weight increment, said simulated skins being fittable one over the other for simulating weight gain and loss as said simulated skins are added and removed, respectively;

increasing said doll's torso size as said individual gains an increment of weight by adding a predetermined number of said simulated skins onto said torso one over the other, said added skins corresponding to said weight gain; and

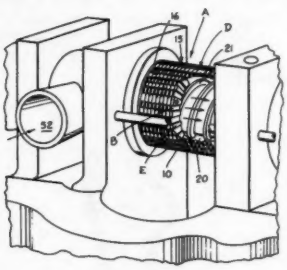
decreasing said doll's torso size as said individual loses an increment of weight by removing a predetermined number of said simulated skins from said torso, said removed simulated skins corresponding to said weight loss.

5,067,925
INFANTS'S TOY
Atwell G. West, 5521 Jester Dr., Garland, Tex. 75044
Filed Nov. 2, 1990, Ser. No. 608,480
Int. Cl.[5] A63H *33/28*
U.S. Cl. 446—397 12 Claims



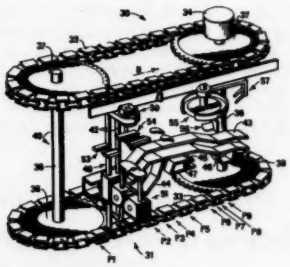
1. An amusement device for an infant comprising:
a soft inner layer that is squeezable and retains its shape after being released;
a pliable layer including sound-generating means covering a major portion of said soft inner layer for causing a noise to attract an infant when handled by the infant; and
a cloth outer layer entirely covering said soft inner layer and said pliable layer including said sound-generating means to form a unitary infant's toy.

5,067,926
CYLINDRICAL SIEVE FOR MEAT DEBONING APPARATUS AND METHOD
James B. Richburg, 101 Pumpkin La., Sumter, S.C. 29150
Filed Apr. 5, 1990, Ser. No. 504,856
Int. Cl.[5] A22C *5/00*
U.S. Cl. 452—135 27 Claims



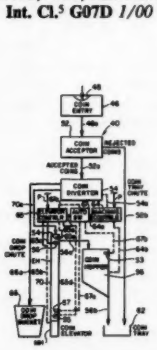
1. A unitary meat deboning sieve which provides a high meat output with low bone content comprising:
a plurality of stacked sieve rings having an inside diameter and an outside diameter;
each said sieve ring consisting of a plurality of radially aligned grooves defined by a plurality of lands circumferentially spaced around said sieve rings;
said grooves being defined by lands having generally divergent side edges extending parallel to a radial of said sieve rings, and said generally divergent side edges of said sieve rings defined radially aligned grooves having opposing sidewalls which are generally parallel to each other;
alignment means for stacking said sieve rings together in a juxtaposed manner to form a sieve assembly with an entrance end and an exit end;
a pressure chamber defined within an interior of said sieve assembly;
a plurality of radially aligned slots defined by said radial aligned grooves between said stacked sieve rings, said radial slots being generally unobstructed and extending through said sieve from said pressure chamber to an exterior of said sieve; and
means for clamping said stacked rings together in a unitized sealed construction.

5,067,927
REVOLVING POULTRY THIGH DEBONER
Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, and Bastiaan Verrijp, Burg de Zeeuwstraat 143, Numansdorp, both of Netherlands
Continuation of Ser. No. 331,968 Apr. 3, 1989, now abandoned.
Filed Jun. 11, 1990, Ser. No. 536,081
Int. Cl.[5] A22C *25/16*
U.S. Cl. 452—136 14 Claims



1. A method of deboning poultry thighs or the like comprising the steps of grasping a thigh bone at a first knuckle with a bone holder; cutting the skin, meat or tissue near the one end of the bone adjacent the first knuckle after grasping the thigh bone; moving the skin meat or tissue away from the first knuckle after cutting the skin, meat or tissue; engaging the thigh bone adjacent the first knuckle with meat stripper means; moving the thigh bone and the meat stripper means with respect to each other along the length of the thigh bone until the meat stripper means passes over the other knuckle of the thigh bone; cutting the meat adjacent the other knuckle to separate the meat from the bone; wherein the bone holder and the thigh are moved along a processing path through a series of processing stations, and the thigh bone is rotated about its length with respect to the meat and the meat stripper means as the thigh bone and the meat stripper means move with respect to each other along the length of the thigh bone.

5,067,928
COIN AND/OR TOKEN OPERATED AND HANDLING APPARATUS
Gary L. Harris, 323 Cuzco Ct., Henderson, Nev. 89014
Filed Nov. 2, 1990, Ser. No. 608,527
Int. Cl.[5] G07D *1/00*
U.S. Cl. 453—17 8 Claims



5. In a coin operated and handling apparatus having a coin acceptor device, a coin diverter mechanism, a hopper payout assembly including a coin hopper having a coin level sensor, a coin storage chamber, a coin return and delivery tray, a first

coin chute for transferring rejected coins from the coin acceptor device to the coin return and delivery tray, a second coin chute for transferring accepted coins from the coin acceptor device to the coin diverter mechanism, first coin directing means in coin flow communication with the coin diverter mechanism for directing accepted coins from the coin diverter mechanism to the hopper payout assembly, second coin directing means in coin flow communication with the coin diverter mechanism for directing accepted coins from the coin diverter mechanism to the coin storage chamber, and machine controller means in electrical communication with the coin level sensor within the coin hopper and with the coin diverter mechanism and responsive to the coin level sensor for directing the coin diverter mechanism to pass accepted coins to the first coin directing means and the payout hopper assembly or to pass accepted coins to the second coin directing means and the coin storage chamber, the machine controller means being in electrical communication with the hopper payout assembly for directing the payout of coins from the coin hopper to the coin return and delivery tray, the improvement comprising:

a) a supplemental coin storage, transport and dispensing mechanism interposed within the first coin directing means and comprising a coin supply elevator including an elevator housing, an upwardly and downwardly moveable coin platform within said housing, a coin input chute for delivering accepted coins to said elevator housing for deposit as a column of coins on said coin platform, a coin discharge port in said elevator housing for delivering accepted coins to said payout hopper assembly, and coin level and platform level sensors for detecting when said elevator is filled with coins and when the elevator platform is at its highest and lowest permissible levels of travel within said housing, said coin input chute being in coin flow communication with the coin diverter mechanism; and

b) an elevator controller mechanism in electrical communication with the machine controller mechanism, said elevator controller mechanism being in electrical communication with and responsive to the coin level and platform level sensors within the elevator housing for directing the coin diverter mechanism to pass accepted coins to the coin input chute and coin supply elevator.

5,067,929

CONSTANT VELOCITY RATIO UNIVERSAL JOINT

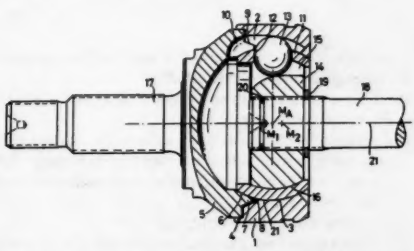
Werner Krude, Neunkirchen-Wolperath, Fed. Rep. of Germany, assignor to GKN Automotive AG, Siegburg, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 561,972

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1989, 3925857

Int. Cl.[5] F16D *3/30*

U.S. Cl. 464—145 3 Claims



1. A constant velocity ratio universal joint, comprising:

an outer joint member having a rotational axis;

a plurality of ball-receiving tracks in the interior of the outer joint member, spaced circumferentially from one another about said rotational axis and having center lines which lie in meridian planes;

an inner joint member having a rotational axis;

a plurality of ball-receiving tracks provided on the inner joint member, with center lines which lie in meridian planes about said rotational axis of the inner joint member and facing the tracks of the outer joint member in pairs;

a plurality of balls disposed one in each facing pair of tracks in the joint members;

the tracks in the joint members being undercut-free considered from one end of the outer joint member;

a joint base member attached to the outer joint member at said one end;

a control element holding the balls with their centers a common plane, and having an external guide surface; and

a part-spherical guide surface engaged by said external guide surface of the control element, said part-spherical guide surface comprising a first portion in said outer joint member between the tracks thereof and a second portion in said joint base member, said first portion being undercut-free considered from said one end of the outer joint member, and said second portion being undercut-free in the opposite axial direction, the outer joint member, at said one end thereof where it is attached to the joint base member, having a surface expanding frusto-conically from the largest diameter of its first part-spherical guide surface portion and the joint base member having a projection with an external surface of frusto-conical configuration and having its undercut-free second portion of the part-spherical guide surface formed with said projection.

5,067,930

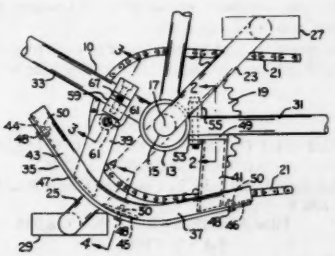
BICYCLE SPROCKET PROTECTOR

Robert Morales, 15561 Product La. D-8, Huntington Beach, Calif. 92649

Filed Dec. 20, 1990, Ser. No. 631,333

Int. Cl.[5] F16H *7/18*

U.S. Cl. 474—144 12 Claims



1. A protector for the sprocket of a bicycle, wherein the bicycle comprises a frame that includes a hub sleeve having an axis transverse to the plane of the frame, an axle extending through said sleeve on said axis, a horizontal axis sprocket carried on said axle outboard from said sleeve, a rear fork extending generally horizontally from said hub sleeve in a rearward direction, and a front frame element extending forwardly and upwardly from said sleeve directly away from the rear fork:

said protector comprising a curved protector body positionable directly below said hub sleeve said curved body having a concave face presented upwardly toward the hub sleeve and a convex face presented downwardly toward the ground surface; said curved body having a leading portion located below the front frame element of the bicycle and a trailing portion located below the rear fork of the bicycle; a first strut extending upwardly from the leading portion of the curved body; a first clamp having a swivel connection with said first strut, said first clamp having means thereon for tightening the clamp around the front frame element; a second strut extending upwardly from the trailing portion of the curved body;

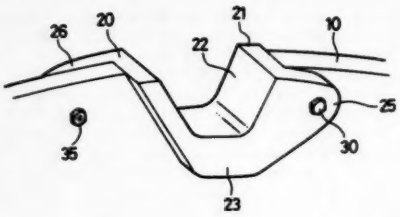
and a second clamp carried on said second strut for clamping engagement with the rear fork of the bicycle; said clamps being individually disengageable from the bicycle frame to enable the protector to be removed from the bicycle or installed on the bicycle without altering the bicycle structure.

5,067,931

SPROCKET WHEEL HAVING REPLACEABLE TEETH

Hiromitsu Nagamatsu, and Seitaro Ueda, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,626
Claims priority, application Japan, Nov. 30, 1989, 1-312460
Int. Cl.[5] F16H *9/00*
U.S. Cl. 474—162 6 Claims



1. A sprocket wheel comprising:

a wheel body having an outer periphery and a plurality of notches formed in the outer periphery of the wheel body, the notches being regularly spaced from each other;

a plurality of replaceable teeth, each tooth consisting of a central portion having an upper surface which forms a tooth groove, said central portion being fitted into said notch of the wheel body, and right and left flanges which are formed respectively ahead of and behind the central portion, or vice versa; and

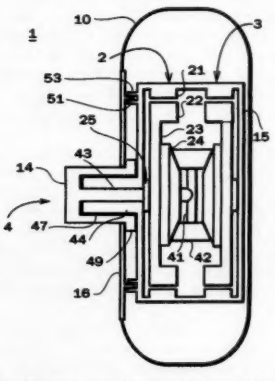
fixing means by which each flange of each tooth is detachably fixed to each side of each notch of the wheel body.

5,067,932

DUAL-INPUT INFINITE-SPEED INTEGRAL MOTOR AND TRANSMISSION DEVICE

Jonathan R. Edwards, 39 E. Patuxent Beach Rd., California, Md. 20619

Filed Nov. 28, 1990, Ser. No. 618,934
Int. Cl.[5] F16H *3/72*
U.S. Cl. 475—5 24 Claims



1. A combination motor and transmission device comprising

first power input means for receiving a first input of electrical power,

second power input means for receiving a second input of electrical power, and

power conversion means for converting said electrical power of said first and second inputs for output, said power conversion means including a mechanical power transmission unit, said power transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means and an output for outputting the converted power as rotational mechanical power,

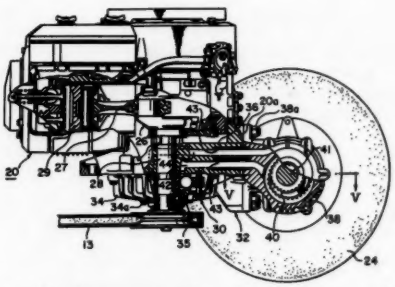
wherein the rotational speed of said output is continuously variable, and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said mechanical transmission unit, each said integral combination involving said two respective elements thereof being directly associated mechanically and geometrically with each other without substantial spacing or other elements including bearings and shafts therebetween.

5,067,933

UNITIZED POWER SYSTEM AND VEHICLES EMPLOYING SAME

Lee R. Hardesty, Horicon, Wis., and Izumi Takagi, Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan and Deere & Company, Moline, Ill.

Continuation of Ser. No. 161,026, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 89,146, Aug. 25, 1987, abandoned. This application Nov. 2, 1990, Ser. No. 608,027
Claims priority, application Japan, Aug. 28, 1986, 61-202535
Int. Cl.[5] F16H *47/04*
U.S. Cl. 475—32 46 Claims



1. A unitized power system for a small vehicle comprising:

(a) an engine having a crankshaft;

(b) a drive train operatively connected to said engine, said drive train including

a variable speed transmission including a variable hydraulic pump operatively connected to output means associated with the crankshaft of the engine and to an hydraulic motor, and

a driving axle arrangement; and

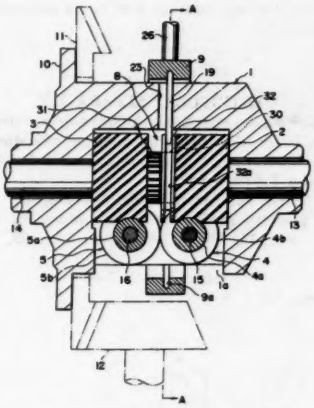
(c) a housing enclosing said drive train and at least a portion of said engine, said housing comprising a lower casing portion fixedly connected to a crankcase of the engine, a pump cover portion for encasing said variable hydraulic pump, and an axle housing portion for encasing said driving axle arrangement, said portions being fixedly connected to each other to form a unitary body.

5,067,934

DIFFERENTIAL GEAR MECHANISM

Kazuhiko Sato, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 497,713
Claims priority, application Japan, Mar. 27, 1989, 1-34418[U]
Int. Cl.[5] F16H *1/445, 1/36*
U.S. Cl. 475—227 6 Claims



1. A differential gear mechanism comprising:

a differential case rotatably driven from outside thereof;

a pair of worm gears provided in said differential case, each of the worm gears being connected to different axle shafts, said worm gears being arranged coaxially and being rotatable independently;

a plurality of element gears, each of said element gears comprising a worm wheel and at least oen spur gear, the at least one spur gear being non-rotatably mounted on each respective end of the worm wheel, said element gears being arranged in at least one pair such that the worm wheel of one element gear of the at least one pair meshes with one worm gear, while the worm wheel of the other element gear of said at least one pair meshes with the other worm gear, the at least one spur gear of one element gear of the at least one pair meshes with the at least one spur gear of the other element gear of the at least one pair, each of the said at least one pair of element gears being arranged tangentially to the periphery of its respective worm gear and being rotatably mounted on the differential case; and

clutch means provided between said worm gears for connecting and disconnecting said worm gears with one another, the clutch means comprises:

first and second gear wheels provided between said worm gears coaxially therewith, said first gear wheel being provided at one of said worm gears and being rotatable therewith, said second gear wheel being provided at the other of said worm gears and being rotatable therewith, and

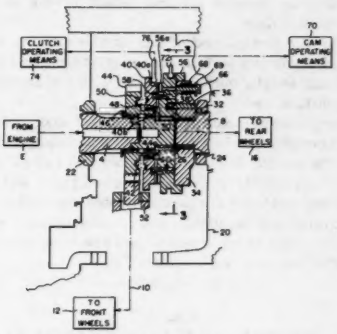
a movable clutch ring provided between said worm gears, said clutch ring being movable in an axial direction of the worm gears and being engaged with at least one of the gear wheels, said clutch ring being movable between a connected state and a disconnected state, the clutch ring in the connected state operatively connects both the first and second gear wheels and the clutch ring in the disconnected state engages only one of the first and second gear wheels whereby the gear wheels are selectively connected and disconnected with one another.

5,067,935

INTERAXLE DIFFERENTIAL

Anthony K. Brown, Exeter, England; Alvin A. Choma, Grosse Pointe Farms, and Timothy R. Edwards, Warren, both of Mich., assignors to Dyneer Corporation, Scottsdale, Ariz.

Filed May 17, 1990, Ser. No. 524,739
Int. Cl.[5] F16H *37/08*
U.S. Cl. 475—248 10 Claims



1. An interaxle differential for selectively connecting an input shaft with a pair of output shafts one of which is longitudinally aligned with said input shaft, comprising:

(a) means connecting said input shaft with said one output shaft;

(b) clutch means normally connecting the other of said output shafts with said input shaft;

(c) velocity responsive means operable from a deactivated condition to an activated condition for disengaging said clutch means when the rotational velocity of said other output shaft exceeds that of the input shaft by a given value;

(d) fail safe means normally biasing said velocity responsive means toward its deactivated condition; and

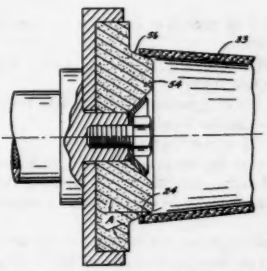
(e) means for operating said velocity responsive means from the deactivated condition to the activated condition.

5,067,936

METHOD FOR MANUFACTURING A YARN CARRIER

Carroll E. Gandy, and Roland S. Watford, Jr., both of Darlington, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 498,987, Mar. 26, 1990, Pat. No. 5,014,928.
This application Feb. 20, 1991, Ser. No. 658,191
Int. Cl.[5] B31C *7/02, 11/02*
U.S. Cl. 493—287 2 Claims



1. A method of manufacturing a yarn carrier of the type which is adapted to be mounted on a winding machine and have a yarn wound thereon to form a yarn package, and comprising the steps of

winding a fibrous sheet of paper so as to form a tubular

member which defines a central axis, and parallel inner and outer wall surfaces,

severing the tubular member adjacent at least one end thereof and including moving a knife blade radially inwardly with respect to the resulting tubular member, and so as to produce a cut end surface which lies in a plane which is substantially perpendicular to said central axis and a relatively sharp annular burr at the intersection of said cut end surface and said inner wall surface,

providing an abrasive grinding wheel having an annular grinding surface,

aligning said one cut end of said tubular member with said annular grinding surface of said grinding wheel and such that said annular burr is in contact with said annular grinding surface, and

relatively rotating said grinding wheel and said tubular member about said central axis while grinding and removing the annular burr to form a beveled end of relatively soft loosened fibers of noncompressed paper, and with the beveled end being at a predetermined angle relative to the central axis of the tubular body so that substantially all of the loosened fibers lie in a plane radially outside a projection of the inner wall surface.

5,067,937

SYSTEM FOR ERECTING CARTONS

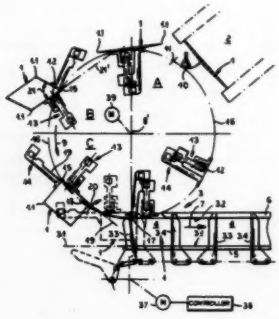
Hans Aschaber; Rudolf Bailer, both of Laupheim; Fritz Fochler, Senden; Bernd Kleinstäuber, Burgrieden, and Reinhold Ruf, Laupheim, all of Fed. Rep. of Germany, assignors to Uhlmann Pac-Systeme GmbH & Co. KG, Laupheim, Fed. Rep. of Germany

Filed Sep. 14, 1990, Ser. No. 583,374

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930720

Int. Cl.[5] B31B *5/78, 5/80*

U.S. Cl. 493—310 **12 Claims**



1. A method of operating a system for erecting boxes, the system comprising:

a supply of flattened boxes having panels separated at respective fold lines;

a support wheel generally continuously rotating about an axis adjacent the supply;

a grab on the support wheel;

an unfolder on the wheel adjacent the grab, the grab and the unfolder being pivotal on the wheel about a grab axis parallel to the wheel axis and defining thereabout an orbit; and

a conveyor adjacent the wheel having upper and lower elements defining parallel and vertically spaced upper and lower conveyor planes, and front and rear elements displaceable parallel to the planes therebetween and defining respective conveyor cells, the upper plane being generally tangent to the orbit of the grab axis, the method comprising the steps of sequentially:

a) engaging a box with the grab and with the unfolder;

b) pivoting the grab and unfolder about the grab axis until the box is erected and an upper panel of the erected box engaged by the grab extends parallel to the upper conveyor plane but is spaced above the upper conveyor plane;

c) synchronously pivoting the grab and unfolder about the grab axis after erecting the box and while rotating the wheel to maintain the upper panel of the box parallel to the upper conveyor plane until the upper panel lies generally on the upper conveyor plane; and

d) releasing the box from the grab into a respective cell of the conveyor.

5,067,938

CENTRIFUGAL SEPARATOR

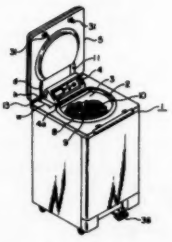
Tadahiro Uchida, Sayama; Kuniyuki Shimamura, Niiza; Hayabu Nogawa, Tokyo; Keikichi Saito, Kawagoe, and Minoru Hara, Sakado, all of Japan, assignors to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,962

Claims priority, application Japan, Mar. 20, 1987, 62-41330[U]; Mar. 23, 1987, 62-43357[U]; Mar. 25, 1987, 62-44831[U]

Int. Cl.[5] B04B *7/06*

U.S. Cl. 494—12 **12 Claims**



7. A centrifugal separator comprising:

a case which has a top panel that includes an opening to a rotor chamber within said case;

a lid pivotally mounted on said case for closing said opening;

a lid lock mechanism disposed in said case for engaging and disengaging lock means with and from a hook on said lid in response to a lateral motion of an operating plate in said case;

a pedal disposed adjacent the bottom of said case;

a transmission mechanism coupled to said pedal for transmitting a vertical motion of said pedal to said operating plate;

a motion changing mechanism disposed between said transmission mechanism and said operating plate, for changing the vertical motion of said pedal to the lateral motion of said operating plate; and

biasing means between said case and said lid for biasing said lid toward its open position to open the lid when said lock means are disengaged from said hook;

said lid lock mechanism comprising:

a base plate disposed in said case in opposing relation to a front panel of said case;

a pair of lock plates mounted on said base plate, said lock plates being rotatable about a common shaft in a plane parallel to said front panel of the case, each of said lock plates having said lock means protruding thereof in a direction perpendicular to said plane for engagement with said hook;

a spring coupled between said pair of lock plates for biasing said lock means toward one another to hold said hook between said lock means;

said operating plate being mounted on said base plate for lateral movement relative thereto, and said operating plate being coupled to said pair of lock plates to cause rotational movements of said pair of lock plates about said common

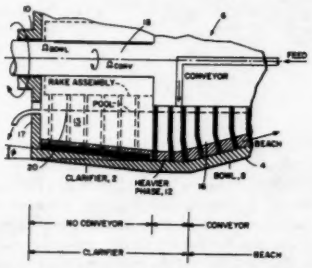
shaft in opposite directions relative to one another so that said lock means are disengaged from said hook by a lateral motion of said operating plate in one direction against the biasing force of said spring.

5,067,939

CONVEYORLESS CLARIFIER

Ascher H. Shapiro, Jamaica Plain, Mass., assignor to Bird Machine Company, South Walpole, Mass.

Filed Mar. 21, 1990, Ser. No. 496,906
Int. Cl.[5] B04B *1/20*
U.S. Cl. 494—53 **23 Claims**



1. A rotating bowl decanter centrifuge for continuous operation for separating a lighter phase from a heavier phase, said centrifuge comprising

a clarifier section in which the heavier phase is separated from the lighter phase,

said clarifier section having an effluent discharge end at which said lighter phase is discharged and an outer wall on which said heavier phase is deposited,

a beach section downstream of said clarifier section, said beach section receiving the heavier phase from said clarifier and having an inwardly inclined outer wall as well as a conveyor for conveying the heavier phase toward the heavier phase discharge end of the centrifuge,

said clarifier section having a first portion without the conveyor from said effluent discharge end part way to said beach section, and having a second portion with the conveyor in the remaining portion of the clarifier adjacent to the beach section, and

said outer wall of said clarifier having in the part without the conveyor an outward incline angle, Φ, sufficient to cause the heavier phase to be moved by centrifugal force along said wall to said beach section.

5,067,940

METHOD AND APPARATUS FOR CONTROLLING THE GROWTH OF CARTILAGE

Abraham R. Liboff, Birmingham, Mich.; Bruce R. McLeod, Bozeman, Mont., and Stephen D. Smith, Lexington, Ky., assignors to Life Resonances, Inc., Bozeman, Mont.

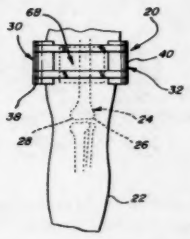
Continuation-in-part of Ser. No. 172,268, Mar. 23, 1988. This application Oct. 31, 1988, Ser. No. 265,265
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] A61N *2/04*
U.S. Cl. 600—13 **6 Claims**

1. A method for regulating the growth characteristics of cartilage, said cartilage being subject to an ambient magnetic field, comprising the steps of:

positioning magnetic field generating means adjacent a living subject such that a region of cartilage of said subject occupies a predetermined space, said region of cartilage being subject to an ambient magnetic field;

generating an applied magnetic flux with said magnetic field generating means, said applied magnetic flux extending through said region of cartilage parallel to a predetermined axis projecting through said predetermined spaced and combining with said ambient magnetic field to form a composite magnetic flux; and

fluctuating said applied magnetic flux and controlling the average value of the magnetic flux density of said combined magnetic flux to create and maintain a predetermined relationship between the frequency of said fluctuations and the magnitude of said magnetic flux density, wherein said average value of said magnetic flux density is a non-zero average value, and wherein said predetermined relationship regulates development of said cartilage, said predetermined relationship being a function of the cyclotron resonance frequency of a predetermined ion present in said cartilage.

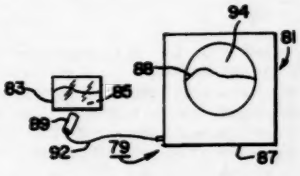


5,067,941

ANTI-MOTION SICKNESS APPARATUS

Katherine A. Hendricks, Chicago, Ill., assignor to Boris Tabakoff and John Newton, both of New Orleans, La., part interest to each

Division of Ser. No. 98,507, Sep. 17, 1981, Pat. No. 4,929,228, which is a continuation of Ser. No. 86, Jan. 2, 1987, abandoned, which is a continuation of Ser. No. 430,172, Sep. 30, 1982, abandoned. This application May 22, 1990, Ser. No. 527,139
Int. Cl.[5] A61M *21/00*
U.S. Cl. 600—27 **5 Claims**



1. An anti-motion sickness apparatus for use in a moving vehicle and comprising

a vehicular motion sensing means adapted to be mounted to said vehicle and providing an electrical signal output indicative of the sensed vehicular motion; and

a vehicular motion simulating display means responsive to said electrical signal output and positioned within the field of vision of a user of said vehicle;

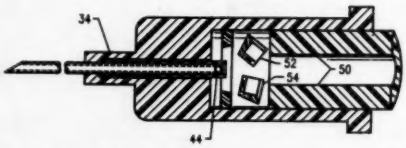
said vehicular motion simulating display means providing a wave motion image visible to the user and corresponding substantially to the vehicular motion sensed by said sensing means.

5,067,942

SINGLE USE HYPODERMIC NEEDLE

Richard A. Jaffe, Palo Alto, and A. Christopher Allison, Pacifica, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Dec. 20, 1990, Ser. No. 632,088
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 8 Claims



1. In combination, a needle and syringe assembly comprising

a syringe having a cylindrical housing with a first open end, a plunger extending into said housing through said open end, and a second end having a Luer tip including a passage communicating with said housing;

a needle including a needle having a sharpened first end and a second end with at least one port through said needle near said second end, a base through which said needle extends, a hub extending from said base for engaging said syringe, and a sheath retractably covering said at least one port, and

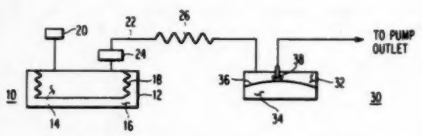
means in said syringe for retracting said sheath when said syringe and needle are assembled, said means being effectively destroyed upon disassembly of said syringe and needle, and said sheath again covering said port upon disassembly of said syringe and needle thereby preventing re-use of said needle.

5,067,943

PRESSURE REGULATOR FOR IMPLANTABLE PUMP

Paul Burke, Woonsocket, R.I., assignor to Infusaid, Inc., Norwood, Mass.

Filed Sep. 26, 1989, Ser. No. 412,376
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—141 12 Claims



1. An implantable drug delivery system comprising:

a pressure actuated drug dispensing device having a sealed body, said sealed body having a flexible drug reservoir containing a fluid, an outlet from said flexible drug reservoir and a propellant chamber in said sealed body pressurized to a pressure to urge said fluid from said flexible drug reservoir into said outlet, and

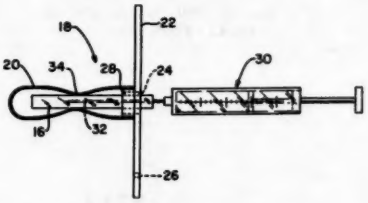
a flow regulating device having a regulator chamber and a sensing chamber, said regulator chamber and said sensing chamber separated and maintained in isolation from each other by a flexible diaphragm, said outlet supplying said fluid into said regulator chamber, an outlet catheter coupling said regulator chamber to a drug delivery site, a regulator seal in said regulating chamber of said flow regulating device, said regulator seal positioned relative to said diaphragm to vary the flow of fluid to said outlet catheter and, means not using said fluid to establish a reference pressure in said sensing chamber that is substantially equal to said pressure in said propellant chamber.

5,067,944

HYPODERMIC NEEDLE GUARD

Robert N. Nichols, Lakewood, Ohio, assignor to Jerry Robles, Oracle, Ariz.

Continuation of Ser. No. 215,298, Jul. 5, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 481,782
Int. Cl.[5] A61M *5/32*; B65D *83/10*
U.S. Cl. 604—192 9 Claims



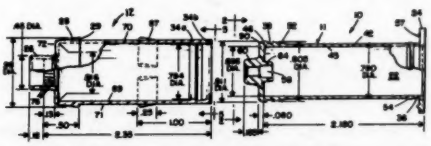
1. A medical protection device comprising a hand shield with a hypodermic needle cap holder tube connected thereto, said hand shield comprising a flat plate with a hole suitable for the insertion of a needle cap substantially in the center thereof, and said needle cap holder tube comprising a transparent flexible, cylindrical tube having a wall thickness of between 0.04 to 0.06 inches and an open end therein connected about said hole at right angles to said plate, and having a closed end therein opposite to said open end, said tube being compressible about its transverse axis through the application of pinching finger pressure by a user.

5,067,945

SAFETY NEEDLED MEDICAL DEVICES CAPABLE OF ONE-HANDED MANIPULATION

Dana W. Ryan, Franklin; James M. Kaiser, and Robert M. Hinsch, both of Brentwood, all of Tenn., assignors to Ryan Medical, Inc., Brentwood, Tenn.

Continuation-in-part of Ser. No. 162,569, Mar. 1, 1988, and a continuation-in-part of Ser. No. 224,920, Jul. 27, 1988, Pat. No. 4,923,445. This application Jan. 27, 1989, Ser. No. 303,588
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 38 Claims



1. A medical device for assembly with a hollow needle, comprising:

a) an inner tube member having a substantially cylindrical inner surface, a front end having means for securing the hollow needle thereto, an open rear end, an outwardly extending first gripping flange substantially at said open rear end, and an outer surface having first and second substantially circumferential grooves, said first groove being forward of said second groove, said outer surface having a shoulder adjacently forward of said first groove with said shoulder being slightly larger in diameter than the outer surface of said inner tube member adjacently rearward of said first groove; and

b) a plastic hollow outer shield member having a substantially cylindrical outer surface having at least one second gripping flange extending outwardly therefrom, and an inner surface with an inner diameter slightly larger than

the outer diameter of at least most of said outer surface of said inner tube member, a front end having an opening therein, a substantially open rear end, and at least one inwardly extending protrusion located along the inner surface of said plastic hollow outer shield member, said at least one inwardly extending protrusion for engaging at least one of said first groove and said second groove such that when said at least one inwardly extending portusion engages said second groove, said shield member is maintained in a first retracted position, and when said at least one inwardly extending protrusion engages said first groove, said shield member is locked in a second extended position in which the needle is protected by said shield member,

wherein said at least one inwardly extending protrusion, engaging said second groove is disengageable from said second circumferential groove by application of reverse axial forces on said first and second gripping flanges, and said shield member is slidable between said first position and said second position, and

the inner diameter of said at least one inwardly extending protrusion when engaging said first groove is smaller than the outer diameter of said shoulder and smaller than the outer diameter of said outer surface of said inner tube member directly rearwardly adjacent said first groove, and

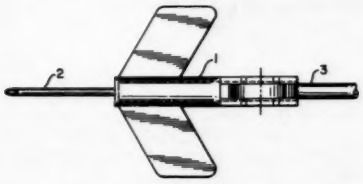
in an assembly mode, said at least one inwardly extending protrusion of said outer shield member engages said shoulder of said outer surface of said inner tube member and flexes outwardly as a result of the engagement, and engages said outer surface of said inner tube member rearward of said first groove without fixedly engaging said first groove.

5,067,946

INJURY RESISTANT NEEDLE DEVICE

Semen Zhadanov, 101 Prospect Park, Metuchin, N.J. 08840

Filed Apr. 10, 1990, Ser. No. 507,247
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 **5 Claims**



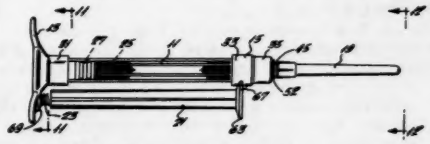
1. An injury resistant needle device, comprising an outer protective tube; a needle unit having a needle which is movable relative to said outer protective tube between an extended position in which said needle is exposed outside of said outer protective tube and a retracted position in which said needle is completely confined inside the outer protective tube; and means for moving said needle unit relative to said outer protective tube between said extended and retracted positions, said moving means including a plurality of first engaging formations provided on said needle unit, and a rotary member provided with second engaging formations interengageable with the first engaging formations and turnable by a user, so that upon turning of said rotary member by a user's finger said needle unit is displaced between said extended and retracted positions.

5,067,947

SYRINGE PLUNGER ROD MOUNT

John F. Volk, Chester Springs, Pa., and Thomas Michaels, Upper Saddle River, N.J., assignors to Tri/West Systems, Inc., Upper Saddle River, N.J.

Filed Jul. 18, 1989, Ser. No. 381,383
Int. Cl.[5] A61M *5/24*
U.S. Cl. 604—201 **9 Claims**



1. A syringe device, comprising;

a vial for medicaments having a first open end and a penetratable seal at its opposite second end;

finger grip means mounted adjacent said first end;

needle hub means for mounting a needle on said second end in axial alignment with said seal actuatable axially between an unarmed position spaced from said seal and an armed position penetrating said seal to access contents of said vial;

an elongated plunger rod;

mounting means for mounting said plunger rod between said finger grip and needle including a fracturable detachable connection of said plunger rod to said hub means operable to normally prevent axial displacement of said hub means to said armed position and upon fracturing of said connection permitting arming and providing visual indicia of breaking of said connection;

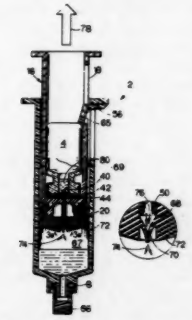
said hub means including a double ended needle assembly axially movable from a first position for detachably mounting said plunger with said mounting means and the second position when said plunger is removed to thereby provide access by said needle to said vial.

5,067,948

SAFETY, PACKAGING, INJECTION AND DISPOSAL SYSTEM FOR PRE-FILLED PHARMACEUTICAL VIALS

Terry M. Haber, Lake Forest, and Clark B. Foster, Laguna Niguel, both of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Sep. 27, 1990, Ser. No. 589,133
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—213 **13 Claims**



1. A vial holding syringe structure, the vial of the type having a pierceable membrane at one end, the syringe structure comprising:

a barrel having a bore, a sealable needle end and a plunger end;

a plunger including a stem, having inner and outer ends, and a piston sized to sealingly engage the bore, the plunger slidably mounted within the barrel at the plunger end for reciprocal movement between a depressed position, with the inner end towards the needle end, and a retracted position, with the inner end spaced apart from the needle end, the barrel and plunger defining a variable volume region at the needle end, a partial vacuum being created in the variable volume region when the plunger moves towards the retracted position;

the stem having an interior sized to house the vial; and

means for transferring the contents of the vial along a path to the variable volume region when the variable volume region is at the partial vacuum, the transferring means including a one-way valve along said path to permit the contents of the vial to flow into the variable volume region but not the reverse without any manipulation by the user, the one-way valve being formed as part of the piston;

whereby the transferred contents of the vial in the variable volume region can be injected through a hollow needle, mounted to the needle end, by the manipulation of the plunger.

5,067,949

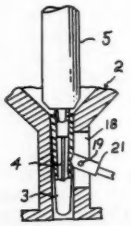
INSTRUMENT FOR UNSHEATHING, RESHEATHING AND DISPOSING OF A MEDICAL SYRINGE NEEDLE

Lawrence F. Freundlich, 923 First St., New Hyde Park, N.Y. 11040, and Arthur Karmen, 110 Colonial Pkwy., Manhasset, N.Y. 11030

Filed Apr. 23, 1990, Ser. No. 512,466

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—263 **5 Claims**



1. An instrument for removing sheathed needles comprising: a container lower member having a broad base and a coned body with a threaded truncated open top end; and an upper member having an annular shoulder at its bottom end defining a threaded cap threadedly engaged onto the top end of the container member, the upper member having a neck portion extending axially upward from the shoulder and terminating in a head provided with a coned cavity, the coned cavity merging at its bottom with a narrow passage extending axially down through the neck portion and communicating with the open top end of the container member, the neck portion having a vertically extending slot through its side wall opening into the narrow passage, a cam element pivotably mounted between opposed walls of the slot, the cam element having a handle portion extending externally of the slot and having at its opposite end a cam surface which cam surface is movable into the narrow passage as the cam element is pivoted by its handle in one direction and is movable out of the narrow passage as the cam element is pivoted by its handle in an opposite direction, the coned cavity serving as a guide to manual entry of a sheathed end of a medical syringe down into the narrow passage, and the cam element being adapted upon being pivoted in the one direction to press its cam surface against the sheathed end of the syringe to allow the syringe to be manually drawn free of its sheathed end, and the cam element being adapted upon being pivoted by its handle in the opposite direction to free the cam surface from the sheathed end to allow the separated sheathed end to drop down the narrow passage into the container below.

5,067,950

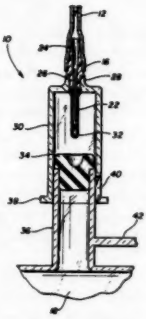
WOUND DRAINAGE TUBE/RESERVOIR CONNECTOR

Cecil H. Broadnax, Jr., Somerset, N.J., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jul. 30, 1990, Ser. No. 559,753

Int. Cl.[5] A61M *1/00, 25/00;* **A61B** *19/00*

U.S. Cl. 604—317 **6 Claims**



1. A connector for joining a wound drainage tube to a fluid reservoir that has an inlet tube sealed with an initially imperforate penetrable plug, the connector comprising

a) a hollow penetrator, having a first end for removable attachment to the drainage tube and a second, sharpened end for penetrating the plug;

b) an initially imperforate, rupturable stocking for preventing fluid flow out of the sharpened end of the penetrator;

c) an elongated skirt for confining the sharpened end of the penetrator, having a longitudinal axis, means at a first end for removable attachment to the penetrator, and an open second end that permits the skirt to surround the inlet tube and be moved along the inlet tube in a direction parallel to the skirt axis,

whereby moving the skirt along the inlet tube permits the sharpened end of the penetrator to rupture the stocking and penetrate the plug to provide a path for fluid to flow from the wound drainage tube to the fluid reservoir.

5,067,951

OPHTHALMOLOGIC APPARATUS

Peter Greve, Essingen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Sep. 7, 1989, Ser. No. 404,099

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1988, 3830378

Int. Cl.[5] A61N *5/06*

U.S. Cl. 606—004 **2 Claims**

1. An ophthalmologic apparatus for conducting a coagulation treatment and for performing microsurgery on an eye of a patient, the apparatus comprising:

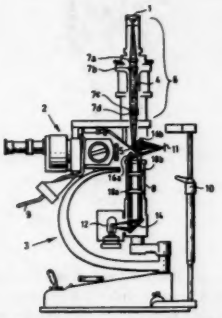
a frame defining first and second mounting structures in substantial alignment with each other;

a slit lamp mounted on said first mounting structure and including: a light source means for supplying light; a lens assembly defining a first optical axis; and, mirror means straddling said first optical axis so as to define a clear opening therethrough along said axis;

said lens assembly and said mirror means conjointly defining a beam path along which the light of said light source means is directed toward the eye of the patient;

a laser module having at least one semiconductor laser diode

means for selectively generating continuous-wave laser radiation for performing the coagulation treatment and pulsed laser radiation for performing the microsurgery, the laser module having a lens unit means for defining a second optical axis along which the laser radiation travels; said lens unit means being mounted on said second mounting structure to cause said second optical axis to be coincident



with said first optical axis to conjointly define a common axis therewith and to permit said laser radiation to pass through said opening; and,

a manipulator mirror pivotally mounted on said frame and at a predetermined location on said common axis for deflecting the laser radiation out of said common axis and toward the eye of the patient requiring treatment or surgery.

5,067,952

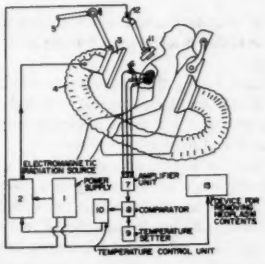
METHOD AND APPARATUS FOR TREATING MALIGNANT TUMORS BY LOCAL HYPERPYREXIA

Vasily F. Gudov, ulitsa Kachalova, 16, kv. 1, Moscow; Nikolai E. Yakhontov, Ulitsa Osharskaya, 52a, kv. 2, Gorky; Vladimir P. Kharchenko, ulitsa akademika Piljugina, 8, kv. 484, Moscow; Boris K. Dolotov, Ulitsa Proletarskaya, 5, kv. 301, Gorky; Evgeny L. Belousov, ulitsa Semashko, 2, kv. 49, Gorky; Valery B. Vinitsky, Leningradskoe shosse, 78, kv. 20, Moscow; Alexandr M. Kozlov, ulitsa Lesnaya, 10, kv. 162, Moskovskaya oblast, Reutov; Mikail G. Akhalaya, ulitsa Lenina, 24, kv. 7, Sukhumi; Alexandr D. Koveshnikov, ulitsa Kirovogradskaya, 44, korpus 8, kv. 160, Moscow, and Valery F. Pugachev, prospekt Tsiolkovskogo, 30, kv. 43, Gorkovskaya oblast, Dzerzhinsk, all of U.S.S.R.

Filed Apr. 2, 1990, Ser. No. 503,529

Int. Cl.[5] A61B *17/36*; A61N *2/10*

U.S. Cl. 606—28 **8 Claims**



1. A method for treating a malignant tumor in a patient which comprises the steps of:

(a) determining the location and dimensions of said tumor in said patient's body;

(b) determining the activity of neutrophils and macrophages, and if said activity is below 100 bacteria per 100 neutrophils, administering tuftsin intravenously to said patient in a dose of 0.01 to 20 mg per 1 kg of patient's body weight;

(c) introducing into said patient's body a suspension containing ferromagnetic particles having a size of from 5×10^{-3} to 30×10^{3} μm, and in an amount of from 0.01 to 0.05 g per each cu. cm of said tumor;

(d) monitoring the movement of said ferromagnetic particles through said patient's body by x-ray, and determining the time that said particles penetrate and approach the boundaries of said tumor;

(e) at that time exposing said patient's body to an electromagnetic field at an intensity and for a period of time sufficient to cause hyperpyrexia within said tumor and at a temperature of from 43° to 43.5° C. to ensure destruction of cancer cells in said tumor;

(f) simultaneously with the exposure to said electromagnetic field, exposing said tumor to a magnetic field of an intensity sufficient to retain ferromagnetic particles in said tumor;

(g) determining the activity of neutrophils and macrophages and if said activity is below 100 bacteria per 100 neutrophils repeating steps (b)–(f);

(h) when said activity is greater than 100 bacteria per 100 neutrophils, exposing said tumor to ultrasonic oscillations with said subsequent removal of the contents of the tumor; and

(i) again determining the activity of neutrophils and macrophages and if said activity is below 100 bacteria per 100 neutrophils repeating steps (b)–(f).

5,067,953

CIRCUIT FOR CONTROLLING AN ELECTRO-THERAPY DEVICE

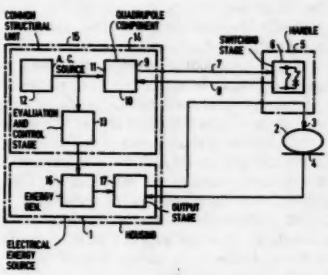
Peter Feucht, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,108

Claims priority, application European Pat. Off., May 19, 1989, 89109074.8

Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—34 **21 Claims**



1. An apparatus for administering treatment to a patient in the form of electrical energy, said apparatus comprising:

a source of electro-surgery energy;

electrode means connected to said source of electro-surgery energy and adapted for delivering said electro-surgery energy to a patient;

an a.c. source;

quadrupole means, connected to said a.c. source, for transmitting alternating current and blocking direct current, said quadrupole means having a primary side connected to said a.c. source and a secondary side voltaically separated from said primary side;

switch means, including a series connected rectifier and user-actuatable switch forming a series branch bridging said secondary side of said quadrupole means, for causing a directionally-dependent change in an electrical parame-

ter at said primary side of said quadrupole means upon actuation of said switch means; and

evaluation and control means connected to said primary side of said quadrupole means and to said a.c. source for detecting said directionally dependent change and for altering delivery of said electro-surgery energy to said patient via said electrode means in response to said directionally-dependent change.

5,067,954

DISTRACTION APPARATUS FOR PLASTIC RECONSTRUCTION OF HAND

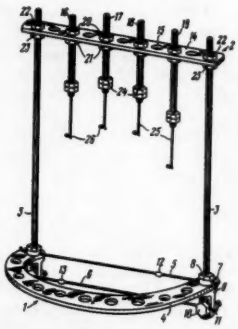
Gavriil A. Ilizarov, ulitsa Klimova, 41, kv. 38., Kurgan, U.S.S.R.

PCT No. PCT/SU88/00140, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO90/00882, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 25, 1988, Ser. No. 490,629

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—58 **4 Claims**



1. A distraction apparatus for plastic reconstruction of a hand, comprising: at least two supports, a proximal support of said supports being made as a cramp-shaped plate carrying two parallel fixing pins secured at ends of said plate, and a distal support of said supports carrying distraction pins secured within the distal support with a possibility of longitudinal motion, as well as two distraction threaded rods on which the proximal support and the distal support are fitted so as to perform relative longitudinal motion, the fixing pins of the proximal support being arranged in a plane perpendicular with a plane of the cramp-shaped plate, the distal support being shaped as a bar having perforations spread along a longitudinal axis of the bar, said longitudinal axis of the bar being parallel to the plane of the cramp-shaped plate, additional distraction threaded rods being fitted in the perforations of the bar of the distal support with a possibility of individual longitudinal motion, said additional distraction threaded rods being directed towards the proximal support, distal ends of the distraction pins being fastened on proximal ends of the additional distraction threaded rods.

5,067,955

VERTEBRAL IMPLANT FOR OSTEOSYNTHESIS DEVICE

Yves P. C. Cotrel, Paris, France, assignor to Societe de Fabrication de Material Orthopedique, Berck sur Mer, France

Filed Apr. 13, 1990, Ser. No. 508,416

Claims priority, application France, Apr. 13, 1989, 89 04926

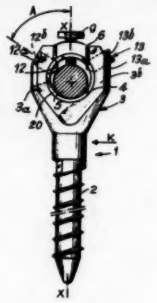
Int. Cl.[5] A61F *5/01*

U.S. Cl. 606—61 **15 Claims**

1. A vertebral implant for an osteosynthesis device, comprising:

an osseous anchoring element; and

a rod securing portion connected to said osseous anchoring element for securing a rod relative to said osseous anchoring element, said rod securing portion including a body member having a channel extending therethrough for receiving a rod therein, a first screw means including a first screw for securing the rod in said channel, said first screw extending radially relative to said channel, and at



least one second screw for further securing the rod in said channel, said body member having a tapped hole inclined relative to said first screw threadedly receiving said second screw therein, and both said first screw and said at least one second screw being substantially disposed in a plane perpendicular to the axis of said channel.

5,067,956

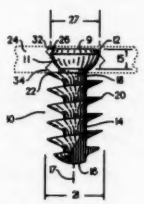
APPARATUS FOR FASTENING A MEDICAL IMPLANT

Thomas B. Buford, III; Robert Brosnahan, both of Germantown; Scott Robinett, and James Clark, both of Memphis, all of Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.

Filed Apr. 24, 1990, Ser. No. 513,640

Int. Cl.[5] A61B *17/58*

U.S. Cl. 606—73 **9 Claims**



1. A non-backing fixation device for a prosthetic implant comprising:

a fastener of a unitary construction having a head member and a shank, said head member having an underside and an upperside;

and said shank having threads along its length, said threads having an outside diameter greater than the width of said head member and said shank having an uppermost thread adjacent to said head member; and

a fixation member having an upperside and underside and a bore therethrough for receiving said fastener, said bore having a diameter intermediate the width of said head member and said outside diameter of said threads of said shank such that, when said fastener is inserted into said bore, to a position wherein said head member is received into said bore and a compressive force is applied to said fixation member, and when said fixation member moves relative to said fastener, said uppermost thread contacts said underside of said fixation member, to prevent said fastener from backing out.

5,067,957

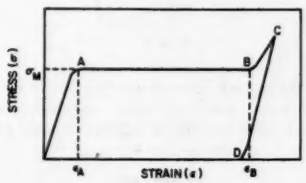
METHOD OF INSERTING MEDICAL DEVICES INCORPORATING SIM ALLOY ELEMENTS

James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 177,817, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 47,824, May 8, 1987, abandoned, which is a continuation of Ser. No. 865,703, May 21, 1986, Pat. No. 4,665,906, which is a continuation of Ser. No. 541,852, Oct. 14, 1983, abandoned. This application Sep. 27, 1988, Ser. No. 252,019

Int. Cl.[5] A61M *25/01*

U.S. Cl. 606—108 41 Claims



1. A method of medical treatment of a mammal which comprises the steps of:

(a) providing a device comprising an element which comprises a shape memory alloy which displays stress induced martensite behavior at body temperature of the mammal, the element being restrained in a deformed configuration, the restraining means stressing the element thereby inducing stress induced martensite in the alloy;

(b) positioning the device so that the shape memory alloy element is within a mammalian body or in such proximity to a mammalian body that the element and the restraining means are substantially at body temperature; and

(c) at least partially removing the restraining means from the element thereby transforming the element from the deformed configuration, the transformation occurring with the element and the restraining means being substantially at body temperature.

5,067,958

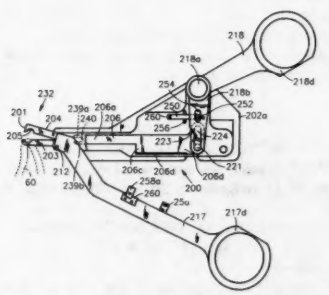
APPARATUS FOR EFFECTING OCCLUSION OF TARGET VESSELS OR TISSUE

Jeffrey J. Sandhaus, Snedens Landing, N.Y., assignor to The Population Counsil, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 326,299, Mar. 21, 1989, Pat. No. 4,967,949, which is a continuation-in-part of Ser. No. 884,417, Jul. 11, 1986, abandoned. This application Nov. 2, 1990, Ser. No. 608,297

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—142 12 Claims



1. Apparatus for implanting a closable clip to effect the occlusion of a target vessel or tissue, comprising first and second jaw members relatively movable between opened and closed positions, said first and second jaw members defining a clip-retaining cavity therebetween, said clip-retaining cavity having sufficient size to accommodate said clip therein, and clip closure means for moving said clip from a retractable position displaced from said clip-retaining cavity to an actuating position within said clip-retaining cavity, and for causing at least partial closure of said clip.

5,067,959

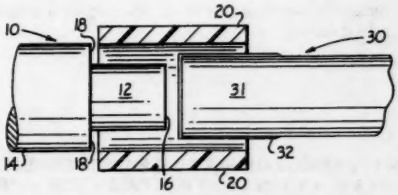
SURGICAL NEEDLE-SUTURE ATTACHEMENT FOR CONTROLLED SUTURE RELEASE

Herbert W. Korthoff, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 413,240, Sep. 27, 1989. This application Jun. 4, 1990, Ser. No. 532,961

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—224 27 Claims



12. A combined surgical needle-suture device exhibiting a predetermined average range or needle separation force for a suture of given size which comprises:

a) a surgical needle possessing shank end of reduced cross-section;

b) a suture possessing a tip region for attachment to the shank end of the needle;

c) a constricted tubing around the reduced diameter shank end of the needle and the tip region of the suture, the constricted tubing exerting an attachment force against the surfaces of the reduced diameter shank end of the needle and the tip region of the suture with which the inner surface of the constricted tubing is in contact without swaging or crimping; and,

d) a bonding agent upon at least some portion of the inner surface of the constricted tubing which is in contact with the tip region of the suture and/or upon at least some portion of the tip region of the suture, the bonding force of the bonding agent in combination with the attachment force of the constricted tubing providing a predetermined average range of needle separation force.

5,067,960

MUSCLE FITNESS DETECTION BY COLORIMETRY

Pierre-Andre Grandjean, Bassenge, Belgium, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 6, 1989, Ser. No. 446,593

Int. Cl.[5] A61M *1/10*

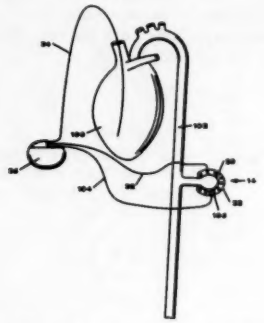
U.S. Cl. 623—3 7 Claims

1. A cardiac assist system for assisting a natural human heart having ventricles which contract at a ventricular rate comprising:

a. a surgically prepared skeletal muscle adapted to be responsively coupled to the circulatory system;

b. control means adapted to be coupled to said natural human heart and coupled to said surgically prepared skeletal muscle for stimulating said surgically prepared skeletal muscle to contract in synchrony with said ventricles of said natural human heart; and

c. means responsively coupled to said surgically prepared skeletal muscle for monitoring a parameter indicative of



changes in the oxygen level in said surgically prepared skeletal muscle.

5,067,961

NON-BIODEGRADABLE TWO PHASE CORNEAL IMPLANT AND METHOD FOR PREPARING SAME

Charles D. Kelman, New York, N.Y., and Dale P. DeVore, Chelmsford, Mass., assignors to Autogenesis Technologies, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 157,638, Feb. 18, 1999, Pat. No. 4,969,912. This application Feb. 15, 1990, Ser. No. 481,503

Int. Cl.[5] A61F *2/14*

U.S. Cl. 623—5 **27 Claims**

1. A non-biodegradable corneal implant comprising:

(1) a polymerized transparent, solubilized, non-fibrous collagenous core having acylated amine or esterified carboxyl groups, and

(2) a polymerized periphery surrounding said core, said periphery comprising fibrous collagen in the form of fibrils under suitable physiological conditions.

5,067,962

BIOPROSTHETIC LIGAMENT

Todd D. Campbell, Corona, and Michael A. Zozaya, Laguna Hills, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

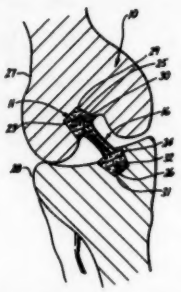
Continuation of Ser. No. 339,804, Apr. 18, 1989, abandoned. This application Sep. 28, 1990, Ser. No. 590,312

Int. Cl.[5] A61F *2/08*

U.S. Cl. 623—13 **5 Claims**

1. A method of replacing a damaged or diseased ligament with a replacement preserved animal ligament having first and second end portions connected to a piece of that ligament natural bone, which bone piece is shaped into a plug comprising;

securing the first ligament end bone piece into a recess formed in that bone of the patient to which an end of the damaged or diseased ligament is attached; and



securing the second ligament end bone piece into a recess formed in that bone of the patient to which a second end of the damaged or diseased ligament is attached.

5,067,963

METHOD OF MAKING LIVE AUTOGENOUS SKELETAL REPLACEMENT PARTS

Roger K. Khouri, St. Louis, Mo., and A. Harri Reddi, Bethesda, Md., assignors to Washington University, St. Louis, Mo.

Filed Aug. 21, 1990, Ser. No. 570,442

Int. Cl.[5] A61F *2/28, 2/36*

U.S. Cl. 623—16 **7 Claims**

1. A method for the manufacture of live autogenous skeletal replacement parts through muscle flap molding and osteoinduction comprising the steps of:

a) forming a mold of physiologically inert support material into the shape of a replacement part for a defective skeletal site,

b) placing a muscle flap into the cavity of the mold,

c) thoroughly incorporating osteoinductive factor in the muscle flap,

d) closing the mold,

e) allowing osteogenesis to take place, and

f) implanting the resulting newly formed bone into said defective skeletal site.

5,067,964

ARTICULAR SURFACE REPAIR

James W. Richmond, Kalamazoo, Mich., and John J. Block, Rumson, N.J., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Dec. 13, 1989, Ser. No. 450,903

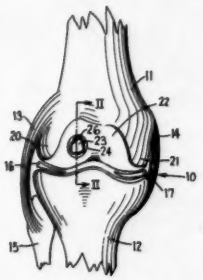
Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—18 **18 Claims**

1. An articular cartilage repair piece to be substituted for damaged articular cartilage on a bone in an articulated joint in a mammal, comprising:

a repair piece including a backing layer of nonwoven, felted

fibrous material, the material being selected from the group consisting of PTFE and polyester, the backing layer being limp and readily conformable to flat and curved surfaces, the backing layer having a back face for application to the site of the damaged articular cartilage for eventual anchoring to the bone, the repair piece having a front face for opposing and coacting interface with adjacent material of the joint, said front face being defined by a coating of tough pliable material having a front surface which is smooth and is slippery in the presence of the natural synovial fluid in the joint, in which said coating is of polyurethane.



5,067,965

BIO-OSMOTIC GEL FOR IMPLANT PROSTHESES

Robert A. Ersek, Austin, Tex.; Arthur A. Beisang, Arden Hills, and Arthur A. Beisang, III, Shoreview, both of Minn., assignors to Bioplasty, Inc., St. Paul, Minn.

Filed Mar. 20, 1990, Ser. No. 496,234

Int. Cl.[5] A61F *2/54;* **A61M** *36/00;* **A61N** *5/00*

U.S. Cl. 623—66 **15 Claims**

1. A radiolucent bio-osmotic gel medium for filling an implant lumen comprising:

a bio-compatible organic polymer in a solution of bio-compatible salt of relatively low Z number;

wherein the organic polymer material of the gel medium is one excretable by the body;

wherein the gel medium is further characterized by having an osmolarity of from about 250 milliosmoles to about 350 milliosmoles; and

wherein the gel medium has an x-ray absorption under standard exposure approximately equal to that of breast tissue, such that processed mammographic x-ray film will result in an optical density on the x-ray film or 1.2–1.3 and a range of average penetrance from a value greater than 9.2 milliroentgens, to a value of 30 milliroentgens.

5,067,966

2-AMINO-6-CHLORO-4-NITRO-PHENOL DERIVATIVES, PROCESS TO THEIR PRODUCTION AND HAIR DYES CONTAINING THOSE COMPOUNDS

Herbert Mager, Marly, and Braun, Hans-Jürgen, Ueberstorf, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/01523, § 371 Date Aug. 17, 1990, § 102(e) Date Aug. 17, 1990, PCT Pub. No. WO90/07557, PCT Pub. Date Jul. 12, 1990

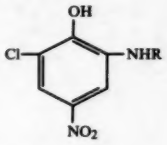
PCT Filed Dec. 12, 1989, Ser. No. 573,177

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843578

Int. Cl.[5] A61K *7/13*; C07C *321/00, 211/00*

U.S. Cl. 8—405 16 Claims

1. 2-amino-6-chloro-4-nitrophenol derivative of the general formula (I)



wherein the radical R is selected from the group consisting of straight-chain alkyl groups with 1 to 5 carbon atoms and branched alkyl groups with 1 to 5 carbon atoms.

5,067,967

NITRO-P-PHENYLENEDIAMINE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND COLOURING AGENTS CONTAINING THESE FOR USE ON KERATIN FIBRES

Mustafa Akram, Offenbach, and Winfried Seidel, Ellerbek, both of Fed. Rep. of Germany, assignors to 501 Hans Schwarzkopf GmbH, Hamburg, Fed. Rep. of Germany

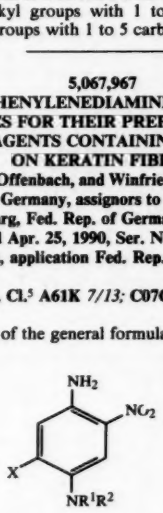
Filed Apr. 25, 1990, Ser. No. 513,996

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917114

Int. Cl.[5] A61K *7/13*; C07C *211/51*

U.S. Cl. 8—415 8 Claims

1. Compounds of the general formula I



I

wherein R^1 and R^2 independently of one another each represent a hydrogen atom, a (C_1–C_2) alkyl group, a hydroxy (C_2–C_3) alkyl group or a 2,3-dihydroxylpropyl group and X represents a trifluoromethyl group.

5,067,968

BRIQUETTE PRODUCT, AND PROCESS FOR ITS PRODUCTION

Joseph W. Davidson, 2645 Dutch Ridge Rd., Guysville, Ohio 45735; Geoffrey Blackmore, 3418 Laredo Dr., Lexington, Ky. 40502; Gerald Blackmore, 3784 Jamaica Ct., Lexington, Ky. 40509; Karl R. Komerek, deceased, late of Elk Grove, Ill., and by Richard Komerek, executor, 1825 Estes Ave., Elk Grove, both of Ill. 60007

Continuation of Ser. No. 316,779, Feb. 28, 1989, abandoned. This application Nov. 1, 1990, Ser. No. 607,214

Int. Cl.[5] C10L *5/00, 5/08*; B30B *11/00*

U.S. Cl. 44—550 29 Claims

1. A process for restructuring particulate coal fines without the introduction of extraneous binder material, comprising the steps of:

drying coal particle feed material substantially comprising particles in the size range up to 1/16 inch square, and predominantly in the range 28 mesh to zero, to remove interfacial water, and heating the material to a temperature in the range of about 75 to 250 degrees Celsius, within a reducing gaseous environment;

compressing the material into a constrained briquette form at a pressure in the range 30,000 to 50,000 psi, within said environment, to cause plastic flow in bridging relation with granular interfaces of the body, to at least form a coherent body having a dense cohesive case of relatively low porosity; and, cooling the formed body to a temperature below the auto-ignition temperature of said form, whereby there is imparted to the briquette sufficient strength when cool to withstand bulk handling without substantial damage.

15. An apparatus for reconstituting coal from naturally occurring coal fines wet feed material of variable water content, generally in the size range up to 1/16 inch mesh and predominantly particulate 28 mesh to zero into a compacted form possessing adequate crushing strength to withstand bulk handling without substantial damage, comprising a high pressure cavity die roll press operable in a pressure range above about 30,000 psi to about 50,000 psi; gas heating means for producing hot reducing gas at a pressure above atmospheric; dryer means to receive said hot reducing gas and said wet feed material in mutual heat exchange relation therein to evaporate a portion of said water content and to raise the temperature of said feed material to the plasticity point; first feed means for feeding said feed material to said press including feed bypass means to bypass feed material past said press; and second feed means including first cooling means to cool said compacted form in heat exchange relation with said wet feed material; and second cooling means to cool said compacted form to a cooled, non-auto combusting condition.

5,067,969

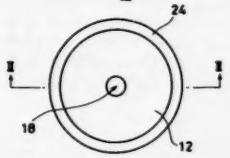
CUTTER AND MANUFACTURING METHOD THEREFOR

Yusaku Matsuda, Yamatokoriyama, Japan, assignor to Sanwa Diamond Industrial Co., Ltd., Japan

Filed Mar. 9, 1990, Ser. No. 491,341

Int. Cl.[5] B24D *3/00*

U.S. Cl. 51—293 9 Claims



1. A cutter comprising:

a base plate formed by joining two thin annular members with each other;

a groove formed in the outer periphery of said base plate; and

an annular metal supporting plate, to be positioned in said groove of said base plate, having a plurality of openings formed therethrough;

a cutting member formed around the outer periphery of said base plate with said supporting plate surrounded thereby;

wherein said cutting member is formed by sintering a mixture of abrasive grains and powders formed by alloying copper, cobalt and tin with each other.

5,067,970
ASYMMETRIC POLYIMIDE MEMBRANES

I-Fan Wang, Olney, and Bhupender S. Minhas, Columbia, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 11, 1990, Ser. No. 522,003
Int. Cl.[5] B01D *53/22, 71/64*
U.S. Cl. 55—16 10 Claims

1. An asymmetric polyimide membrane comprising a unitary membrane having a thin dense skin supported on a porous substructure, characterized in that

(a) said skin and substructure are composed of a fully imidized polymer based on 5(6)-amino-1-(4'-aminophenyl)-1,3-trimethylindane;

(b) it has a pre diameter of less than 20 Å;

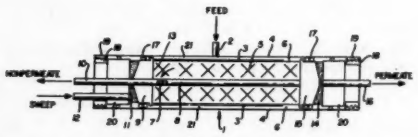
(c) it has a CO_2/CH_4 selectivity of at least 20; and

(d) it has CO_2 permeability of at least 1 SCFH/ft^2 at 100 psi.

5,067,971
PROCESS FOR DEHYDRATION OF GASES AND COMPOSITE PERMEABLE MEMBRANES THEREFOR

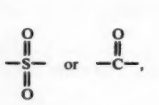
Benjamin Bikson, Brookline; Salvatore Giglia, Norwood, and Joyce K. Nelson, Lexington, all of Mass., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 478,681, Feb. 12, 1990, abandoned.
This application Nov. 6, 1990, Ser. No. 609,625
Int. Cl.[5] B01D *53/22, 71/68*
U.S. Cl. 55—16 56 Claims



1. A gas dehydration process comprising contacting a water vapor-containing feed gas with one side of a composite membrane comprising a porous support and an ultrathin layer of a separation barrier of a sulfonated aromatic polymer having an average molecular weight above about 10,000 and a degree of sulfonation -S_m of from about 0.2 to about 2 selected from the group of sulfonated polysulfone or sulfonated polyether ketone having units:

wherein Ar is divalent phenylene or divalent biphenylene and y is:

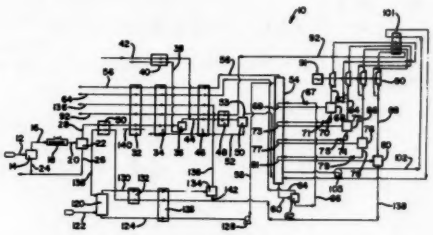


permeating water vapor contained in said feed gas through said composite membrane and recovering a nonpermeate water vapor-diminished gas stream and a water enriched permeate stream.

5,067,972
PURIFICATION OF GASES

John W. Hemmings, Randburg; Peter Allan, and Gerald M. O'Shaughnessy, both of Johannesburg, all of South Africa, assignors to Aeci Limited, South Africa

Filed Jan. 26, 1990, Ser. No. 470,649
Claims priority, application South Africa, Jan. 26, 1989, 89/0637; Dec. 18, 1989, 89/9705
Int. Cl.[5] B01D *53/14*
U.S. Cl. 55—40 8 Claims



1. A process for removing acid gas components from a gas stream, which comprises

feeding the gas stream into an absorption zone;

passing a suitable physical solvent at elevated pressure and reduced temperature countercurrently through the zone, thereby to absorb acid gas components from the gas stream into the solvent to form a spent or acid gas laden solvent;

removing heat from the absorption zone, thereby to maintain the absorption zone at substantially isothermal condition;

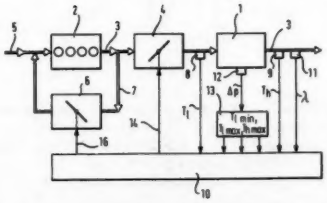
regenerating the spent or acid gas laden solvent by subjecting it to flashing at reduced pressure; and

effecting the flashing substantially isothermally by utilizing heat removed from the absorption zone.

5,067,973
METHOD OF AND AN APPARATUS FOR REGENERATING A DIESEL PARTICULATE EXHAUST FILTER

Konstatin N. Pattas, Abelonon 73, 55535 Thessaloniki, Greece

Filed Mar. 23, 1990, Ser. No. 497,651
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—96 9 Claims



1. A method of regenerating a diesel particulate exhaust soot filter mounted in the exhaust pipe of a diesel engine, the exhaust being throttled upstream of the diesel filter, as viewed in flow direction, so that at least the regenerating temperature is reached, comprising the steps of:

(a) measuring the actual temperature (T_l and T_h) upstream and downstream of the diesel filter;

(b) automatically initiating regeneration when a first setpoint exhaust temperature (T_{lmin}) is reached upstream of the diesel filter;

(c) automatically turning off the regeneration when a second setpoint exhaust temperature (T_{lmax}) upstream of the diesel filter is exceeded;

(d) preventing regeneration of the diesel filter by controlling

the throttling when a predetermined third exhaust temperature (T_{hmax}) downsteram of the diesel filter is exceeded; and

(e) varying said first, second and third setpoint exhaust temperatures (T_{lmin}, T_{lmax}, T_{hmax}) in response to the pressure drop (Δp) across the diesel filter.

5,067,974

APPARATUS FOR PURIFYING POLLUTANT GASES

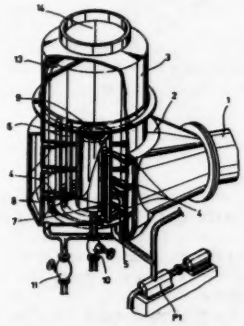
Ha Y. Chang, Seoul, Rep. of Korea, assignor to Hydundae Enviroment Energy Mgmt. Corp., Ltd., Rep. of Korea

Division of Ser. No. 431,331, Nov. 3, 1989, Pat. No. 5,022,896. This application Mar. 29, 1991, Ser. No. 677,791

Claims priority, application Rep. of Korea, Nov. 9, 1988, 14678/1988

Int. Cl.[5] B01D *47/00*

U.S. Cl. 55—223 **1 Claim**



1. A pollutant gas purifying apparatus comprising a suction fan for delivering a pollutant gas to an annular gas feed tube, a cylindrical water tank longitudinally installed along an inner circumferential surface of said annular gas feed tube, a plurality of connecting tubes arranged radially within said cylindrical water tank, said connecting tubes comprising a plurality of nozzles arranged along said connecting tubes, said nozzles having outlets being arranged in one direction substantially perpendicular to the axes of said connecting tubes, said connecting tubes and said annular gas feed tube being interconnected to thereby feed said pollutant gas to said nozzles arranged along said connecting tubes, a pump connected to a plurality of water tubes being longitudinally installed inside said cylindrical water tank, a plurality of nozzles being arranged vertically along said water tubes and opening in said one direction, and an auxiliary water tank installed at the center of said cylindrical water tank, said auxiliary tank comprising a level probe operatively connected to a solenoid valve to actuate said valve, said valve being connected to a lower part of said auxiliary water tank.

5,067,975

METHOD OF MANUFACTURING OPTICAL WAVEGUIDE FIBER WITH TITANIA-SILICA OUTER CLADDING

Marcella R. Backer; Ralston Cavender, both of Wilmington, N.C.; Melanie L. Elder, Dublin, Calif.; Peter C. Jones, Wilmington, N.C., and James A. Murphy, Painted Post, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 22, 1989, Ser. No. 456,141

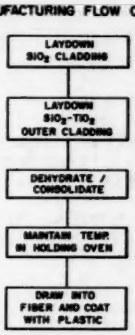
Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—3.12 **14 Claims**

1. A method of making a glass blank with a TiO_2—SiO_2 outer cladding layer for drawing into an optical waveguide fiber with a TiO_2—SiO_2 outer cladding having a predetermined TiO_2 concentration profile, comprising,

depositing glass soot in the form of a preform including an outer cladding of TiO_2—SiO_2, said outer cladding including an outermost layer having an initial TiO_2 concentration greater than 10.5 wt. %,

exposing said preform to an atmosphere containing chlorine and at a temperature in the range of from 900° to 1400° C., the chlorine being supplied in a sufficient concentration, for a sufficient time and at a sufficient temperature to increase the size of TiO_2 crystals in said outer cladding of


MANUFACTURING FLOW CHART
LAYDOWN SiO2 CLADDING
LAYDOWN SiO2-TiO2 OUTER CLADDING
DEHYDRATE / CONSOLIDATE
MAINTAIN TEMP IN HOLDING OVEN
DRAW INTO FIBER AND COAT WITH PLASTIC

TiO_2—SiO_2 such that the concentration of resulting TiO_2 crystals with diameters in the range of 0.3 to 5 μm is greater than or equal to 0.1 vol. %, and

consolidating said preform into said glass blank with a TiO_2—SiO_2 outer cladding layer,

wherein the resulting TiO_2 concentration in at least said outermost layer of the TiO_2—SiO_2 outer cladding layer of the glass blank is greater than 10.5 wt. % and less than said initial TiO_2 concentration.

5,067,976

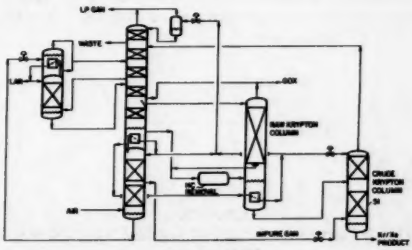
CRYOGENIC PROCESS FOR THE PRODUCTION OF AN OXYGEN-FREE AND METHANE-FREE, KRYPTON/XENON PRODUCT

Rakesh Agrawal, Allentown; Brian E. Farrell, Fogelsville, and Keith B. Wilson, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 5, 1991, Ser. No. 650,522

Int. Cl.[5] F25J *3/04*

U.S. Cl. 62—22 **2 Claims**



1. In a process for separating a feed gas containing krypton, xenon, oxygen and methane in a cryogenic distillation column wherein the feed gas is fed to an intermediate location of the distillation column for fractionation into a methane-free, krypton and xenon bottoms liquid and a methane-rich waste overhead, wherein liquid reflux for the column is provided by introducing a liquid feed to an upper location in the column above the intermediate feed location, and wherein vapor reflux is provided to the column by introducing a gaseous bottom feed to an lower location in the column below the intermediate

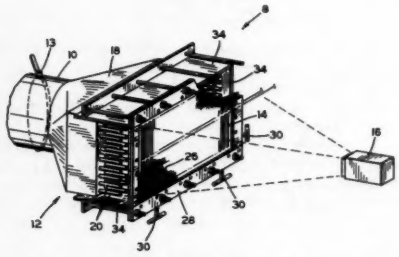
feed location, the improvement for increasing recovery of krypton and xenon and producing a krypton and xenon product containing less than 1 ppm oxygen and 1 ppm methane comprises using a gaseous stream containing less than 1 ppm oxygen and 1 ppm methane as the gaseous bottom feed and operating the column so that the vapor to liquid flow ratio in the column is less than 0.15.

5,067,977

METHOD AND APPARATUS FOR MEASURING THE EFFICIENCY OF COOLING DEVICES

Sugato Deb, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Feb. 5, 1991, Ser. No. 650,697
Int. Cl.[5] C03B *27/00*
U.S. Cl. 65—29 **18 Claims**



11. A method for defining the pattern of heat removal from a sheet-like member by an adjacent heat exchanger comprising the steps of:

heating a sheet-like element adapted to represent said sheet-like member according to a predetermined pattern;

directing cooling air against one of the major surfaces of said sheet-like element to remove heat from said one major surface;

simultaneously measuring the temperature over the other major surface of said sheet-like element; and

determining the pattern of heat removal by the heat exchanger from the sheet-like element from the temperature of said other surface.

5,067,978

METHOD FOR THE REMOVAL OF LEAD FROM WASTE PRODUCTS

Benjamin P. Fowler, 805 S. Country Club, LaPorte, Tex. 77057

Continuation-in-part of Ser. No. 539,992, Jun. 18, 1990, which is a continuation-in-part of Ser. No. 398,246, Aug. 24, 1989, Pat. No. 4,934,286. This application Aug. 17, 1990, Ser. No. 568,861
Int. Cl.[5] C03B *5/08*
U.S. Cl. 65—134 **10 Claims**

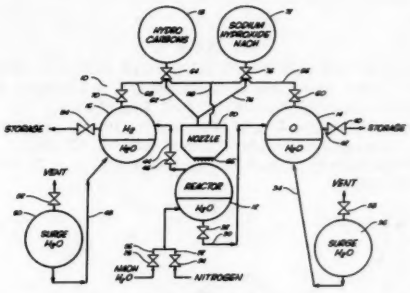
1. A process for the removal of lead from a waste product comprising the steps of:

delivering silica to a chamber;

removing oxygen from said chamber;

heating said silica in said chamber to a temperature of greater than 1500° F.;

combusting a lead-containing waste within said chamber;



mixing the combusted lead-containing waste with the heated silica so as to form a leaded glass; and

removing said leaded glass from said chamber.

5,067,979

SINTERED BODIES AND PRODUCTION PROCESS THEREOF

Yoshisato Kiyota; Junichi Ohta; Hiroshi Ohtsubo, and Shigeaki Takajo, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Division of Ser. No. 393,765, Aug. 14, 1989, Pat. No. 4,964,907. This application Jul. 6, 1990, Ser. No. 549,491
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] C22C *29/00*
U.S. Cl. 75—243 **5 Claims**

1. A sintered magnetic body of the Fe-Si type consisting essentially of 1.5–6.5 wt. % of Si, up to 0.5 wt./T of O, up to 0.03 wt. % of C, and the balance of Fe and imperative impurities and having a density ratio of at least 95%.

5,067,980

RECORDING PROCESS AND LIQUID USING WATER-SOLUBLE ORGANIC SOLVENT

Shoji Koike, Yokohama, and Yasuko Tomida, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 137,339, Dec. 23, 1987, abandoned. This application Jul. 17, 1990, Ser. No. 553,363
Claims priority, application Japan, Dec. 26, 1986, 61-310825
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 **14 Claims**

1. An aqueous recording liquid, comprising: a colorant selected from the group consisting of acidic dyestuffs, direct dyestuffs, vat dyestuffs, oil-soluble dye-stuffs, sulfide dyestuffs and dispersion dyestuffs, a water-soluble organic solvent, from 0.5–10 wt. % of a nonionic surfactant selected from the group consisting of polyoxyethylene alkylether, polyoxyethylene alkyl phenylether, polyoxyethylene fatty acid ester, sorbitan fatty acid ester, polyoxyethylene sorbitan fatty acid ester, polyoxyethylene alkylamine, glycerine fatty acid ester, and oxyethylene oxypropylene block polymer, and from 20–95 wt. % water, said organic solvent having a surface tension of at most 45 dyne/cm, wherein said colorant is at most 0.1 wt. % soluble in water at 20° C. and at least 3 wt. % soluble in said solvent.

5,067,981

METHOD FOR RENDERING TOXIC WASTE HARMLESS

Carel W. J. Hooykaas, Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Rotterdam, Netherlands

Filed Sep. 27, 1989, Ser. No. 413,335
Claims priority, application Netherlands, Sep. 29, 1988, 8802398
Int. Cl.[5] C04B 7/14
U.S. Cl. 106—790 11 Claims

1. In a method for treating toxic waste in which the waste is mixed with water and a pulverent inorganic reagent based on calcium compounds to form a transportable fluid slurry which may be hardened, the improvement comprising the steps of: employing ground granulated blast furnace slag as the reagent; and adding a hardening activator to the slurry to accelerate hardening without the inclusion of any additional acid or basic means to obtain a material having a strength of more than 50 psi.

5,067,982

CORN STEEPING PROCESS AND APPARATUS

Abraham Caransa, Uithoorn, and Jan van den Dorpel, Bussum, both of Netherlands, assignors to Dorr-Oliver Incorporated, Milford, Conn.

Filed Nov. 3, 1989, Ser. No. 431,124
Int. Cl.[5] C08B 30/04; A23L 1/10
U.S. Cl. 127—67 13 Claims

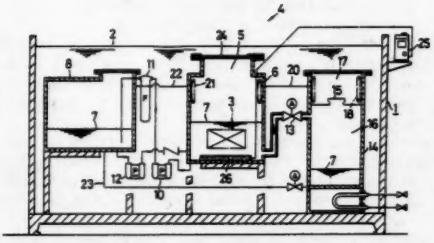
1. A corn steeping process wherein corn grains in one or more vessels are contacted with sulphur dioxide containing steeping liquid at a temperature of from 40° to 55° C., characterized in that the steeping is performed in a fluidized bed formed from corn grains and the steeping liquid.

5,067,983

METHOD AND APPARATUS FOR CLEANING OBJECT

Masahide Uchino, Tokyo, Japan, assignor to Japan Field Company Ltd., Tokyo, Japan

Filed May 29, 1990, Ser. No. 529,416
Claims priority, application Japan, May 29, 1989, 1-135461
Int. Cl.[5] B08B 3/04, 3/10, 3/12, 7/02
U.S. Cl. 134—1 24 Claims



1. A method of cleaning an object by using an inflammable cleaning liquid, comprising the steps of:

inserting a cleaning means, comprising a container, having an openable and closable cover, and for containing said inflammable cleaning liquid, within a holding tank;

inserting said object to be cleaned within said container so as to be immersed within said inflammable cleaning liquid;

filling said holding tank with an incombustible liquid such that said container is entirely immersed within said incombustible liquid; and

operating said cleaning means so as to clean said object to be cleaned disposed within said container.

5,067,984

OIL ABSORBENT

Tina F. Starr, General Delivery, Salmo, British Columbia, V0G 1Z0, Canada

Filed Dec. 19, 1989, Ser. No. 458,562
Int. Cl.[5] B08B 7/00; B01J 20/24
U.S. Cl. 134—7 4 Claims

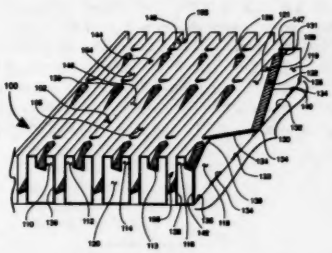
1. A petroleum or petroleum by-product degradation compound, consisting exclusively of a mixture limited to flour, dry powdered ground mustard, and a wetting agent, said wetting agent being in a small amount just sufficient to produce a paste when admixed with said ground mustard and flour; wherein said mustard is an oil-active surfactant agent; wherein said paste is destined to be spread onto an oil spill on a land surface, and wherein the oil is to be absorbed by the paste and broken down into a crumbly powder, which can then be easily collected.

5,067,985

BACK-CONTACT VERTICAL-JUNCTION SOLAR CELL AND METHOD

Michael W. Carver, Niceville, Fla., and Edward S. Kolesar, Jr., Beavercreek, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 8, 1990, Ser. No. 534,981
Int. Cl.[5] H01L 31/068, 31/18
U.S. Cl. 136—255 32 Claims



1. Vertical-junction back contact solar cell apparatus comprising the combination of:

a wafer of semiconductor material having upward and downward facing surfaces and predetermined thickness, first conductivity type dopant, crystal orientation, and concentration;

an array of radiant energy capturing vertical walled and tilted flat bottomed cavity members disposed in rows across said semiconductor wafer upward facing surface with each of said cavities including an internal surface area received layer of pn-junction forming second conductivity type dopant containing semiconductor;

a first grid of electrically interconnected electrodes dispersed across said downward facing wafer surface in surface contact with first electrical polarity current collection regions of each said pn-junction inclusive cavity member;

a second grid of electrically interconnected electrodes electrically segregated from said first grid and dispersed across said downward facing wafer surface in surface contact with second electrical polarity current collection regions of each said pn-junction inclusive cavity member.

5,067,986

PROCESS FOR PRODUCING COARSE, LONGITUDINALLY ORIENTED COLUMN CRYSTALS IN AN OXIDE-DISPERSION-STRENGTHENED NICKEL-BASE SUPERALLOY

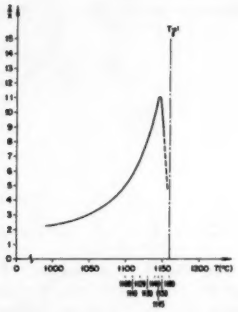
Reinhard Fried, Nussbaumen, and Peter Jongenburger, Baden-Rüitihof, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed May 15, 1990, Ser. No. 524,273

Claims priority, application Switzerland, May 16, 1989, 1819/89

Int. Cl.[5] C22F *1/10*

U.S. Cl. 148—11.5 N 6 Claims



1. A process for producing coarse, longitudinally oriented column crystals with improved temperature change resistance and increased ductility in a transverse direction in a workpiece of any cross-sectional size and cross-sectional shape from an oxide-dispersion-strengthened nickel-base superalloy, which exists in the initial condition in fine-grained hot-worked form, by a coarse-grain annealing which initiates the secondary recrystallization, which process comprises first annealing the workpiece by heating in a first temperature range between 1000° C. and 1200° C. for ¼ h to 10 h, cooling and isothermally annealing for coarse grain for ¼ h to 5 h in a second temperature range between 1230° C. and 1280° C. and cooling.

5,067,987

METHOD OF MANUFACTURING A SILVER ALLOY WHICH IS BLACKENED THROUGHOUT ITS BULK

Lucien Vachey, 45 avenue des Ternes, 75017 Paris, France

PCT No. PCT/FR89/00057, § 371 Date Nov. 3, 1989, § 102(e) Date Nov. 3, 1989, PCT Pub. No. WO89/08612, PCT Pub. Date Sep. 21, 1989

PCT Filed Feb. 16, 1989, Ser. No. 455,431

Claims priority, application France, Mar. 7, 1988, 88 02879

Int. Cl.[5] C22F *1/02*

U.S. Cl. 148—20.3 10 Claims

1. A method of manufacturing a blackened silver alloy which is blackened throughout its bulk, the method including the steps of:

heating the silver alloy to a temperature lying between about 450° C. and about 700° C.; and,

subsequently exposing the heated silver alloy to sulfur vapor.

5,067,988

LOW TEMPERATURE HYDROGENATION OF GAMMA TITANIUM ALUMINIDE

Francis H. Froes, Moscow, Id.; D. Simon Shong, Kaohsiung, Taiwan; Young-Won Kim, Dayton, Ohio, and Frederick C. Yolton, Coraopolis, Pa., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 2, 1990, Ser. No. 474,197

Int. Cl.[5] C22F *1/18*

U.S. Cl. 148—20.3 12 Claims

5. A method for producing a molded article from gamma titanium-aluminum alloys which comprises the steps of:

(a) rapidly solidifying said alloy to provide a rapidly solidified material having at least one dimension not greater than about 100 micrometers;

(b) diffusing hydrogen into the resulting rapidly solidified material at a temperature in the approximate range of 400° to 780° C.;

(c) diffusing hydrogen out of the hydrogenated solid material, and;

(d) consolidating said solid material in a suitable mold at a temperature of about 0° to 250° C. below the beta transus temperature of said alloy at a pressure of about 5 to 45 ksi to produce said article.

5,067,989

SINGLE CRYSTAL SILICON

Shuji Yokota, and Hirotoshi Yamagishi, both of Annaka, Japan, assignors to Shin Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1990, Ser. No. 570,680

Claims priority, application Japan, Aug. 23, 1989, 1-216569

Int. Cl.[5] H01L *29/36*

U.S. Cl. 148—33 4 Claims

1. Single crystal silicon for use as a substrate of semiconductor integrated circuits, comprising as impurities Cu, Fe, Ni and Cr in individual concentrations, respectively, of not more than 0.1 ppta and in a total content of not more than 0.4 ppta, whereby the silicon reduced oxygen-induced stacking faults.

5,067,990

METHOD OF APPLYING PHOSPHATE CONVERSION COATINGS TO FE-R-B SUBSTRATES, AND FE-R-B ARTICLES HAVING A PHOSPHATE CONVERSION COATING THEREON

Raymond Ribitch, Mt. Pleasant, Mich., assignor to Hitachi Metals International, Ltd., Purchase, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,490

Int. Cl.[5] C23C *22/14*

U.S. Cl. 148—262 6 Claims

1. A method of providing a phosphate conversion corrosion resistant coating over an iron-rare earth-boron alloy substrate, said substrate being itself not directly susceptible to phosphatizing, comprising the steps of:

activating said substrate in a sulphuric acid or nitric acid;

layering said substrate with a nickel by an electrolytic or electroless process from an acid solution, said nickel being susceptible to application of a phosphate conversion coating; and

applying a phosphate conversion coating to said layered nickel.

5,067,991

FE-BASED SOFT MAGNETIC ALLOY

Takao Sawa, and Masami Okamura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1989, Ser. No. 362,134

Claims priority, application Japan, Jun. 13, 1988, 63-143756

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—305 4 Claims

1. An Fe-based soft magnetic alloy having high saturation magnetic flux density and excellent soft magnetic characteris-

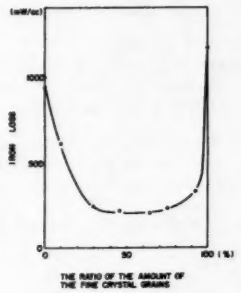
tics, said alloy consisting of a composition represented by the general formula:

$$Fe_aCu_bV_cSi_dB_e$$

(wherein a, b, c, d, and e are number respectively satisfying the following equations:

$$a+b+c/d+e=100\text{(atomic percentage)}$$

$$0.01 \leqq b \leqq 3.0$$



$$5 \leqq c \leqq 15$$

$$10 \leqq d \leqq 25$$

$$3 \leqq e \leqq 12$$

$$17 \leqq d+e \leqq 30),$$

and having fine crystal grains.

5,067,992

DRILLING OF STEEL SHEET

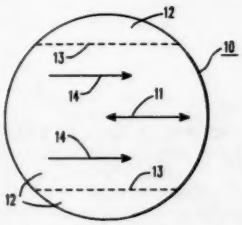
Norman M. Pavlik, Wilkinsburg; John Sefko, Monroeville, and Richard A. Miller, N. Huntingdon, all of Pa., assignors to ABB Power T & D Company, Inc., Blue Bell, Pa.

Division of Ser. No. 257,915, Oct. 14, 1988, Pat. No. 4,963,199. This application Sep. 14, 1990, Ser. No. 582,250

The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

Int. Cl.[5] H01F *1/12*

U.S. Cl. 148—307 **8 Claims**



1. An oriented electromagnetic steel sheet having a stress-relief annealed, oriented structure with a plurality of magnetic domains, the improvement wherein said steel sheet has a plurality of closely spaced, small holes through the entire thickness of the steel sheet, said holes being effective to propagate additional domain walls and subdivide the magnetic domains.

5,067,993

MAGNETIC CORE MATERIAL MADE OF FE-CO BASE ALLOY FOR HIGH FREQUENCIES

Saburo Wakita, Noda; Kiyoshi Yamaguchi, Minamisaitama, and Norio Yanagisawa, Kitamoto, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

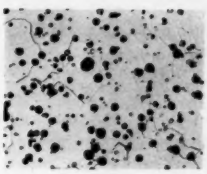
PCT No. PCT/JP88/00817, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO89/01533, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 18, 1988, Ser. No. 345,549

Claims priority, application Japan, Aug. 19, 1987, 62-205940

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—311 **27 Claims**



1. A Fe-Co alloy magnetic core material for use with high frequency signals comprising 45 to 53% by weight of Co, 0.3 to 3% by weight of C, a total of 0.1 to 2% by weight of at least one selected from the group consisting of Mn and Si, and the balance Fe and unavoidable impurities, the structure of said alloy comprising a ferrite matrix containing graphite in an amount of from 1 to 20% by volume dispersed therein.

5,067,994

ALUMINIUM ALLOY, A METHOD OF MAKING IT AND AN APPLICATION OF THE ALLOY

Jens P. Brubak; Bard Eftestol, and Ferenc Ladiszlaidesz, all of Raufoss, Norway, assignors to Raufoss AS, Oslo, Norway

Continuation of Ser. No. 62,620, Jun. 16, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 334,123

Claims priority, application Norway, Jun. 20, 1986, 862466

Int. Cl.[5] C22C *21/00*; B22D *25/00*

U.S. Cl. 148—415 **16 Claims**

6. A method of making an aluminum alloy consisting essentially of aluminum, from 0.5 to 2.0% by weight of Zr and from 0 to 1% of at least one of the elements Mg, Si, Ag, Ni, or Cu, which comprises forming an aluminum melt consisting essentially of Al, 0.5 to 2.0% by weight of Zr and from 0 to 1% by weight of at least one element which is Mg, Si, Ag, Ni or Cu, casting said melt into needle-shaped particles at a cooling velocity of 100°–1,000° C./sec so that the Zr mainly occurs in supersaturated solution in the particles, consolidating said particles whereupon the Zr is precipitated as finely distributed Al-Zr dispersoids by heat treatment in the temperature range of 300° to 400° C., said alloy having an electrical conductivity of at least 58% IACS and a 10% softening temperature of at least 400° C.

5,067,995

METHOD FOR ENHANCING STABILITY OF HIGH EXPLOSIVES, FOR PURPOSES OF TRANSPORT OR STORAGE, AND THE STABILIZED HIGH EXPLOSIVES

Gerald L. Nutt, Menlo Park, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

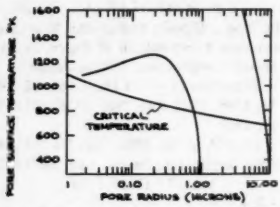
Filed Jun. 15, 1989, Ser. No. 366,715

Int. Cl.[5] C06B *45/00*

U.S. Cl. 149—2 **13 Claims**

1. A method for suppressing the tendency of a porous solid high explosive to ignite and detonate, comprising:

filling substantially all the pres of the solid high explosive material with a predetermined pore radius of at least 10 μm with a relatively inert, stable, pore filling material in liquid form, the pore filling material being selected from



gallium, rubidium-potassium eutectic, and Wood's metal; and

solidifying the pore filling material in the pores of the explosive material.

5,067,996

PLASTIC BONDED EXPLOSIVES WHICH EXHIBIT MILD COOK-OFF AND BULLET IMPACT INSENSITIVE PROPERTIES

Norman H. Lundstrom, Ogden, Utah, and Russell Reed, Jr., Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1977, Ser. No. 844,548
Int. Cl.[5] C06G *45/10*
U.S. Cl. 149—19.4 **6 Claims**

1. An explosive composition comprising:

82 to 85 weight percent particles of cyclic nitramine explosive of which at least 20 weight percent of said particles are 3–5μ in diameter; and

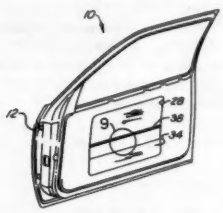
15 to 18 weight percent polyurethane elastomer formed from ethylene oxide capped polypropylene glycol.

5,067,997

METHOD FOR DETERMINING ADHERENCE TO A VEHICLE PANEL SURFACE

David L. LeClerc, Lake Orien, and Wayne A. Conti, Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 7, 1990, Ser. No. 578,376
Int. Cl.[5] G01M *19/00*
U.S. Cl. 156—64 **2 Claims**



1. A method for determining the degree of adherence to a non-flat, opaque vehicle panel surface of a component adhered thereto comprising the steps of:

a. marking a surface area of interest on the vehicle panel exterior surface;

b. applying flowable plastic material to the vehicle panel exterior surface over the area of interest and surrounding areas adjacent thereto;

c. curing the plastic material to a hardened sheet to form a splash and removing the splash from the vehicle panel;

d. cutting the vehicle panel along the periphery of the marked area and removing that portion from the vehicle panel leaving an opening in the shape of the marked area;

e. fastening the splash back onto the exterior surface of the vehicle panel in its original position thereby covering the opening;

f. casting a layer of flowable clear plastic material into the opening from the interior side of the vehicle panel and curing the clear plastic material to a hardened state;

g. removing the splash from the vehicle panel;

h. adhesively securing the component to the exterior surface of the vehicle panel over the layer of clear plastic material; and

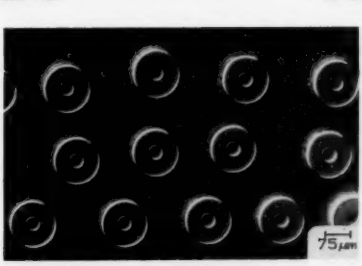
i. visually inspecting the adhered component through the layer of clear plastic material from the interior side of the vehicle panel to determine the degree of adhesion.

5,067,998

FIBROUS MATERIAL-CONTAINING COMPOSITE

Raj N. Singh, Schenectady, and Achuta R. Gaddipati, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 359,609, Jun. 1, 1989, abandoned, which is a division of Ser. No. 135,858, Dec. 21, 1987, Pat. No. 4,931,311. This application Dec. 11, 1989, Ser. No. 448,643
The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.
Int. Cl.[5] C04B *35/80, 35/84;* B32B *18/00, 31/20*
U.S. Cl. 156—89 **19 Claims**



1. A process for making a composite containing boron nitride coated fibrous material embedded in a ceramic matrix which comprises the following steps:

(a) forming a laminated structure comprising at least one layer of boron nitride coated fibrous material disposed between two layers of tape comprising a ceramic matrix material said matrix having a thermal expansion coefficient which is less than about 15% higher than that of the coated fibrous material, and an organic binder material;

(b) heating the laminated structure to remove the organic binding material; and

(c) hot pressing the resulting laminated structure at a temperature and pressure to consolidate said structure to produce a composite having a porosity of less than about 5% by volume, at least about 10% by volume of said composite being said boron nitride coated fibrous material.

5,067,999

METHOD FOR PROVIDING A SILICON CARBIDE MATRIX IN CARBON-FIBER REINFORCED COMPOSITES

Holger H. Streckert, San Diego; James E. Sheehan, Solana Beach, and Khodabakhsh Mazdiyasni, Alpine, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Aug. 10, 1990, Ser. No. 565,953
Int. Cl.[5] C04B *35/56, 35/76*
U.S. Cl. 156—89 **20 Claims**

1. A method for making a composite of a silicon carbide

matrix with carbon-based fiber cloth embedded therein comprising:

(a) providing a preform of carbon-based fiber,

(b) applying a soluble boron compound to the surface of the fibers which form said preform, said boron being in a form suitable for disposing a bonding amount of said boron compound onto said fiber surfaces of said preform,

(c) impregnating said preform with a polysilane,

(d) heating said preform in a first heating step to a temperature sufficient to cure and/or crosslink said polysilane, and

(e) heating said preform in a second heating step to a temperature sufficient to form a silicon carbide matrix with fibers from said carbon-based fiber cloth embedded therein.

5,068,000

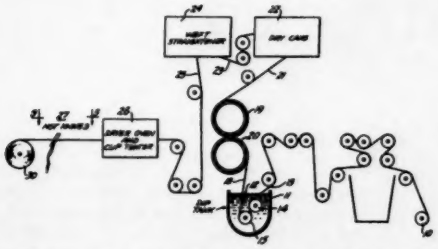
METHOD OF MAKING A REINFORCING FABRIC FOR POWER TRANSMISSION BELTS, HOSES AND THE LIKE

Harold L. Lauderdale, Lanett, Ala., assignor to West Point Pepperell, Inc., West Point, Ga.

Filed Feb. 27, 1990, Ser. No. 485,998

Int. Cl.[5] D06C *27/00, 13/12, 3/04*

U.S. Cl. 156—148 **7 Claims**



1. The process of constructing and processing a bias oriented reinforcing fabric for subsequent coating with a rubber compound, which comprises

(a) forming a web of woven fabric including sizing agents by a suitable flat weaving procedure,

(b) said web having warp and weft yarns, opposite sides, selvedge edges, and a longitudinal axis,

(c) treating the web with heated liquid to soften the sizing agents in said fabric and wet said fabric,

(d) differentially guiding and directing the opposite sides of the softened wet fabric to cause the weft yarns to be re-oriented to lie at an angle to the warp yarns substantially greater than 90°,

(e) drying the re-oriented fabric to cause it to become geometrically stabilized while retaining said yarns substantially in their angularly re-oriented condition by engagement of the fabric by its selvedge edges, and

(f) thereafter, but prior to coating said fabric with rubber compound, removing the selvedge edges from the stabilized dry fabric.

5,068,001

METHOD OF MAKING A SOUND ABSORBING LAMINATE

Reinhold Haussling, Postfach 1269, 6734 Lambrecht/Pfalz, Fed. Rep. of Germany

Division of Ser. No. 133,570, Dec. 16, 1987, Pat. No. 4,828,910. This application Jan. 13, 1989, Ser. No. 297,605

Int. Cl.[5] B32B *31/00*

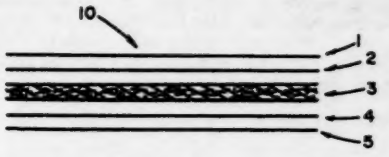
U.S. Cl. 156—222 **21 Claims**

1. A method of forming a three-dimensional sound-absorbing structure comprising:

providing a first reinforcing porous, fibrous mat;

providing a core defined by a resilient thermoformable porous fibrous batt having a thickness of at least about one quarter of an inch;

laminating said mat to one surface of said batt by impregnating said mat and its interface with said batt with sufficient



binder resin to effect adherence therebetween, but insufficient resin binder to form a porosity-blocking film; and

thermoforming said laminate into a porous three-dimensional configuration.

5,068,002

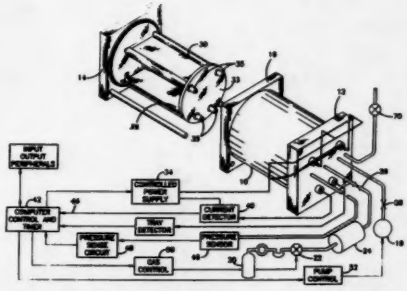
ULTRASONIC GLOW DISCHARGE SURFACE CLEANING

Marvin E. Monroe, Sunbury, Ohio, assignor to Quintron, Inc., Galena, Ohio

Filed Aug. 3, 1989, Ser. No. 389,308

Int. Cl.[5] B44C *1/22;* B08B *3/12*

U.S. Cl. 156—345 **9 Claims**



1. An apparatus for abrading contaminants from the surface of a workpiece and comprising:

(a) a low pressure chamber having a sealable closure;

(b) pumping means connected to the chamber for removing gas;

(c) a source of ionizable gas connected to the chamber;

(d) a set of spaced conductors forming electrodes mounted within the chamber and having a length and width extent to define a three-dimensional cleaning space in the volume defined between them;

(e) a power supply having its output connected to the electrodes for supplying alternating current to the electrodes at an ultrasonic frequency and at a sufficient voltage and current to ionize gas within the chamber to form a plasma; and

(f) a workpiece support means mounted in the cleaning space.

5,068,003

WEAR-RESISTANT TITANIUM ALLOY AND ARTICLES MADE THEREOF

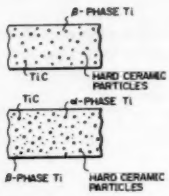
Wataru Takahashi, Nishinomiya; Yoshihito Sugimoto, Takarazuka; Mutsuo Nakanishi, Kobe; Yoshiaki Shida, Ikoma, and Minoru Okada, Nara, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Nov. 9, 1989, Ser. No. 433,963

Claims priority, application Japan, Nov. 10, 1988, 63-282435; Dec. 16, 1988, 63-318783

Int. Cl.[5] C22C *14/00*

U.S. Cl. 148—421 31 Claims



1. A wear-resistant titanium alloy containing crystallized and/or precipitated titanium carbides dispersed in a β-phase matrix of the titanium alloy, the titanium alloy having a single β-phase microstructure.

5,068,004

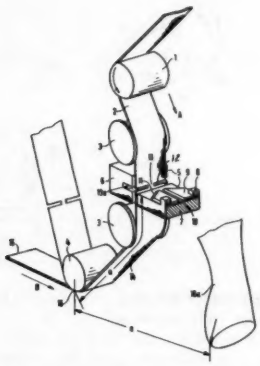
METHOD FOR THE APPLICATION OF LENGTHS OF A TAPE TO A SURFACE AND APPARATUS

Karl-Andreas Moll, Kaarst, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1989, Ser. No. 345,634

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—494 6 Claims



1. A tape dispensing and applying apparatus for applying a length of tape to a surface, comprising:

(a) a casing;

(b) a tape supply and feed roll rotatively mounted on said casing;

(c) two spaced tape guiding elements mounted on said casing along a tape path for said tape supply and feed roll;

(d) a tape dispensing element mounted on said casing in said tape path with said guiding elements intermediate said tape dispensing element and said tape supply and feed roll, for placing a trailing edge of the tape onto the surface;

(e) brake means mounted on said casing for interrupting the dispensing of the tape;

(f) cutting means mounted on said casing for intermediate said tape dispensing element and said tape supply and feed roll for forming a tear line in the tape; and

(g) metering means for indicating the location on the tape where said cutting means should be activated to form a tear line in the tape to defined the leading edge in the tape at a predetermined distance from trailing edge;

(h) whereby, said braking means may be activated after said tear line passes said tape dispensing element to separate a length of tape at said tear line between said trailing edge and said leading edge for application to the surface.

5,068,005

PACKAGING CONTAINER OPENING FORMATION DEVICE FOR A PACKING MACHINE

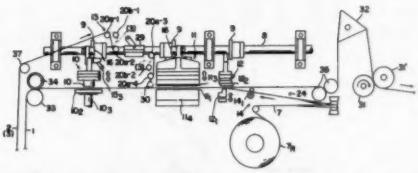
Carl G. Lindskog, Malmoe; Rolf Anderson, Hoor, and Christer Loovv, Lund, all of Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Nov. 29, 1989, Ser. No. 443,467

Claims priority, application Japan, Nov. 30, 1988, 63-304563

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—514 8 Claims



1. A packaging container opening formation device for a packing machine provided along the conveyance path of a packaging web which is intermittently conveyed, comprising:

a punch hole opening section with a punch which opens on said web a punch hole used for a liquid-outlet, said opening section being arranged so that it can withdraw from a punch hole opening position to a punch hole non-opening position;

a strip tape pasting section comprising a heating element and a pressing plate facing each other across said conveyance path of said web, said heating element and pressing plate being switchable respectively with another heating element and pressing plate depending on the width of a strip tape to be used, and said strip tape pasting section closing punch holes opened on said web with a wide strip tape or pasting a narrow strip tape on said web which has no punch holes;

a pull-tab pasting section provided in the downstream of said strip tape pasting section so that a cutting and heating member provided on the side opposite to said strip tape on said web across said conveyance path cuts a pull-tab from a pull-tab tape and heat-deposits it on said web, said pull-tab pasting section being switchable into a non-active position;

a strip tape supply means which supplies wide and narrow strip tapes selectively to said strip tape pasting section; and

a pull-tab supply means which supplies said pull-tab tape to said pull-tab pasting section.

5,068,006

THERMAL INK JET PRINTHEAD WITH PRE-DICED NOZZLE FACE AND METHOD OF FABRICATION THEREFOR

Almon P. Fisher, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 4, 1990, Ser. No. 577,245

Int. Cl.[5] H01L *21/306;* B44C *1/22;* B29C *37/00*

U.S. Cl. 156—633 18 Claims

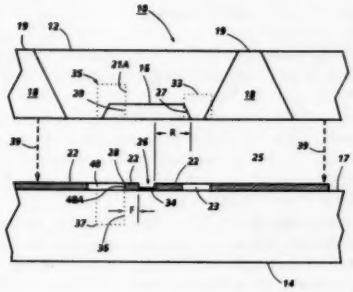
1. A method of fabricating a thermal ink jet printhead having nozzles for ejecting droplets therefrom comprising the steps of:

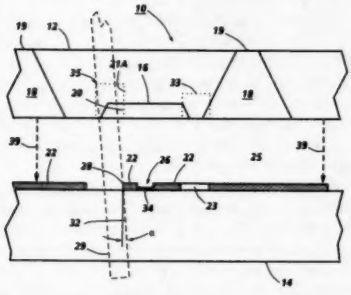
(a) forming a plurality of sets of equally spaced linear arrays of heating elements and addressing electrodes on a surface of an electrically insulative planar substrate, the heating elements being individually addressable with electrical pulses through said electrodes;

(b) depositing a thick film layer of photopatternable polymeric material over the heating elements and electrodes;

(c) patterning the thick film layer to form a plurality of pits therein, each of which exposes one of the heating elements, and to form an associated slot having at least one sidewall for each set of pits, the distance between each set of pits and the associated slot defining the distance to the heating elements from the nozzles, so that the slot sidewall forms a part of the printhead nozzles;

(d) etching a plurality of sets of equally spaced, parallel channel grooves having closed ends and an associated through recess for each set of channel grooves in the surface of a silicon wafer, the through recesses being located adjacent one end of said grooves;





(e) providing means for communication between each set of grooves and their associated through recess;

(f) dicing a first trench in the silicon wafer having a predetermined depth perpendicular to and across each of the groove ends opposite the ones adjacent the through recesses to form a nozzle face containing the groove open ends that will subsequently become part of the printheads nozzles;

(g) aligning and bonding the etched wafer with the planar substrate so that each channel groove contains a heating element therein a determined distance from the open end thereof; and

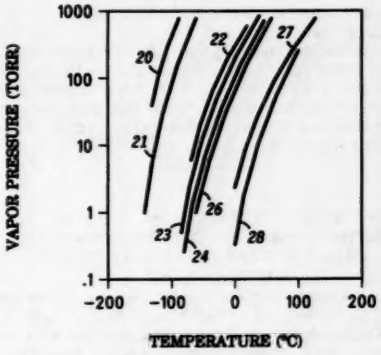
(h) separating the bonded wafer and substrate into individual printheads by a plurality of dicing cuts, one of which includes colinear dicing of the wafer and substrate along and through the wafer trenches, but spaced from the nozzle face.

5,068,007

ETCHING OF MATERIALS IN A NONCORROSIVE ENVIRONMENT

Stephen P. Rogers, Mesa, and Michael S. Lebby, Chandler, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 24, 1990, Ser. No. 587,143
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C23F *1/00*
U.S. Cl. 156—643 **16 Claims**



1. A method for plasma etching semiconductor substrates comprising the steps of:

mounting the semiconductor substrate in a plasma reactor; and

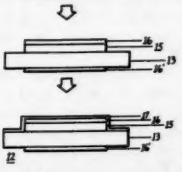
exposing the semiconductor substrate to a gas plasma comprising methane, hydrogen, and trialkylboron.

5,068,008

FORMING SECURITY THREAD FOR CURRENCY AND BANK NOTES

Timothy T. Crane, Dalton, Mass., assignor to Crane & Co., Dalton, Mass.

Division of Ser. No. 433,916, Nov. 9, 1989, Pat. No. 4,941,687.
This application Oct. 29, 1990, Ser. No. 604,456
Int. Cl.[5] B44C *1/22*; C23F *1/02*; B29C *37/00*
U.S. Cl. 156—659.1 **3 Claims**



1. A method of providing a security thread comprising the steps of:

providing a plastic strip having a metallized surface;

applying solvent-resistant pigmented indicia over said metallized surface;

applying a second pigmented coating on a second surface of said plastic strip opposite said metallized surface; and

selectively removing a part of said metallized surface except under said first pigmented indicia to provide said pigmented indicia to said plastic strip.

5,068,009

METHOD OF PRODUCING FLUFF PULP WITH IMPROVED DEFIBRATION PROPERTIES

Olli Jokinen, Kantvik; Jukka Kettunen; Jarkko Lepo, both of Rauma; Tapio Neimi, Monnanummi, and Jaakko E. Laine, Kanvtik, all of Finland, assignors to Cultor Ltd., Finland

Filed Mar. 22, 1990, Ser. No. 497,406

Claims priority, application Finland, Mar. 30, 1989, 891530

Int. Cl.[5] D21C *3/20*; D21B *1/02*

U.S. Cl. 162—9 **13 Claims**

1. A method of producing fluff pulp with improved shredding properties comprising adding an enzyme having cellulolytic and/or hemicellulolytic activity to wood pump at some point prior to shredding to form said fluff pulp, the enzyme being added in an amount sufficient to improve the shredding properties of the pulp.

5,068,010

APPARATUS FOR SECURING OIL, GAS AND BY-PRODUCTS FROM PYROBITUMINOUS SHALE AND OTHER MATTER IMPREGNATED WITH HYDROCARBONS

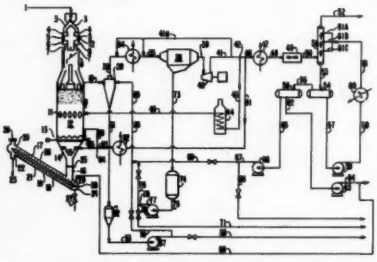
Renê Mundstock; Kuniyuki Terabe; Antonio R. Lamprecht; Joao C. Teixeira, all of Sao Mateus do Sul; Altair R. D. Batista, Rio de Janeiro; Edson d. Dias, Sao José dos Campos; Luiz D. Santos, Macaé ; Osvaldo Amorim, Campinas; Joel Rezende, Curitiba; Jorge H. Filho, Sao Mateus do Sul; Joao C. Gobbo, and Romeu Machado, both of Curitiba, all of Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Division of Ser. No. 136,573, Dec. 22, 1987, Pat. No. 4,944,867. This application May 9, 1990, Ser. No. 520,950

Claims priority, application Brazil, Dec. 22, 1986, PI860636-9[U]

Int. Cl.[5] C10B *1/04*

U.S. Cl. 202—99 **2 Claims**



1. In an apparatus for obtaining oil, gas and other products from pyrobituminous shales and other matter impregnated with hydrocarbons, wherein the apparatus comprises:

a retort having an upper portion, an intermediate portion and a bottom portion,

hopper means for introducing crushed shale downwardly into said upper portion of said retort through a rotating charging device having gas operated sealing means,

first injection means for injecting hot gasses into said intermediate portion of said retort at a temperature of about 500° C. to about 600° C.,

second injection means for injecting cold gasses into said bottom portion of said report at a temperature ranging between 110° C. and 180° C.,

bottom discharge means having water sealing means for discharging crushed shale from said retort,

cyclone means,

duct means connecting said cyclone means to said upper portion of said retort for removing gaseous retorted matter to said cyclone means for separation of heavy liquid components from a gaseous stream containing very fine solids in a mist,

precipitator means connected to said cyclone means for precipitating the very fine solids from said gaseous stream,

compressor means connected to said precipitator means for compressing said gaseous stream,

heater means connected between said compressor means and said first injection means for raising the temperature of a first portion of said gaseous stream to about 500° C.–600° C. for injection into said intermediate portion of said retort to start pyrolysis of the shale,

heat regenerator means connected between said compressor means and said second injector means for reducing the temperature of a second portion of said gaseous stream to about 110° C.–130° C. prior to injection of the second portion of the gaseous stream into said bottom portion of said retort,

spray scrubbing tower means connected to said compressor means for receiving a third portion of said compressed gaseous stream for separation of a gaseous component and a liquid component consisting primarily of water and heavy oil and

decanting means connected to said spray scrubbing tower means for receiving said liquid component;

the improvement comprising:

said first injector means being comprised of a plurality of parallel elongated hollow prismatic elements each having a hexagonal cross-section and including two elongated top plates connected to each other at an angle to form an elongated top vertex,

a pair of elongated parallel vertical side walls connected to lower edges of said two top plates respectively, with each side wall having a horizontal row of holes extending therethrough along the length of the side walls adjacent said top plates, said top plates extending downwardly and outwardly beyond said side walls to provide an overhang on each side to protect said holes from being directly struck by any descending solid particles, said holes having diameters related to each other such that upon passage of a gaseous stream under pressure through the prismatic elements the difference in discharge between a first and second of said holes is from 1% to 5% and lower walls connected to said side walls and connected to each other at an elongated bottom vertex;

said second gas injection means being comprised of a plurality of horizontally disposed circumferentially spaced apart pipes extending through a side wall of said retort and having downwardly and outwardly chamfered inner ends to prevent blockage of said pipes;

water cooled heat regenerator means connected between said cyclone means and said precipitator means for reducing the temperature of gasses issuing from said cyclone means by about 20° C. to 60° C. prior to entering said precipitator means;

heat regenerator means and air-worked cooler means connected in series between said compressor means and said spray scrubbing tower means; and

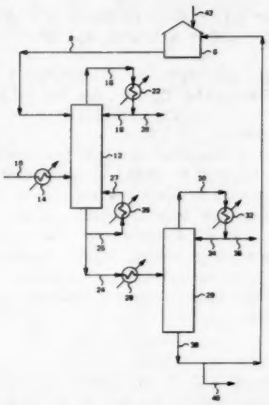
said decanting means being comprised of a first separating decanter having bottom liquid discharge means connected to pump means and conduit means for returning said liquid to said spray scrubbing tower means and upper discharge means connected to a second separating decanter to conduit means wherein said second separating decanter is provided with first outlet means connected to pump means for removing a watery portion and a second discharge means connected to a pump and conduit means for removing an oily portion.

5,068,011

SEPARATION OF MONOOLEFINS FROM PARAFFINS

Fu-Ming Lee, and Ronald E. Brown, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 26, 1990, Ser. No. 604,719
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] B01D *3/40*
U.S. Cl. 203—58 10 Claims



1. A process for separating at least one alkene containing 4–10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed consisting essentially of said at least one alkene and said at least one alkane in the presence of a solvent consisting essentially of at least one N-mercaptoalkyl-2-pyrrolidone, wherein the mercaptoalkyl group contains about 1–5 carbon atoms, optionally in admixture with at least one N-alkyl-2-pyrrolidone, wherein the alkyl group contains 1–3 carbon atoms;

wherein said extractive distillation process produces (i) an overhead distillate product which contains a smaller volume percentage of said at least one alkene and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one alkene and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one alkene is separated from said solvent and recovered from said bottoms product.

5,068,012

THREE DIMENSIONAL MULTI-COATING PROCESS

Shih C. Hsu, No. 6, Alley 3, Lane 181, Min Tsu Rd., Ta Wan Tsun, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Jul. 24, 1990, Ser. No. 556,394
Int. Cl.[5] C25D *1/20*
U.S. Cl. 204—8 1 Claim

1. A three dimensional multi-coating process including the steps of:

(a) electroplating a predetermined design coating on a plastic plate member, said design coating having a predetermined thickness contour;

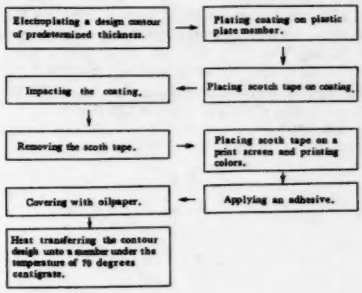
(b) placing said plastic plate design coating in adhesive contact with an adhesive tape layer;

(c) impacting an upper surface of said adhesive tape for transferring said design coating to said adhesive tape;

(d) removing said adhesive tape from said plastic plate member;

(e) print screening predetermined colors into said design coating;

(f) applying adhesive to said design coating;


Electroplating a design contour of predetermined thickness.
Plating coating on plastic plate member.
Impacting the coating.
Placing scotch tape on coating.
Removing the scoth tape.
Placing scoth tape on a print screen and printing colors.
Covering with oilpaper.
Applying an adhesive.
Heat transferring the contour deigh unto a member under the temperature of 70 degrees centigrate.

(g) covering said design coating with oilpaper; and,

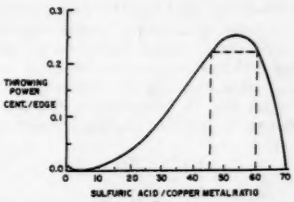
(h) thermally transferring said design coating to a plastic member.

5,068,013

ELECTROPLATING COMPOSITION AND PROCESS

Roger F. Bernards, Wellesley; Gordon Fischer, Sudbury, and Wade Sonnenberg, Foxboro, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 235,051, Aug. 23, 1988, Pat. No. 4,897,165. This application Jan. 29, 1990, Ser. No. 471,639
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] C25D *3/38, 7/00*
U.S. Cl. 204—24 5 Claims



1. A process for electrolytically depositing copper on the conductive walls of through holes in a printed circuit board where said holes have an aspect ratio equal to or greater than 10 to 1 and a length of at least 0.100 inches, said process comprising the steps of electrolytically depositing copper onto the walls of said through holes from a copper plating solution comprising one or more bath soluble copper salts in a concentration sufficient to provide a total copper ion content in an amount sufficient to support plating and not exceeding eight grams per liter of solution and acid in an amount where the acid, expressed as sulfuric acid, to copper weight ratio has an upper limit in accordance with the equation:

$$R=67-2.7(X)$$

and a lower limit in accordance with the equation:

$$R=35-1.3(X)$$

where in each equation, R is the weight ratio of hydrogen ion expressed as sulfuric acid to copper metal and X is the weight of dissolved copper metal in solution.

5,068,014

CATALYTIC COMPOSITION FOR THE POLYMERIZATION OF OLEFINS AND ITS PROCESS OF PREPARATION

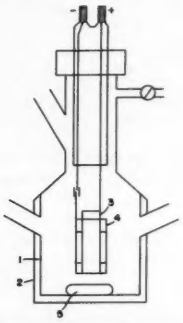
Jean M. Brusson, Lambersart; Karel Bujadoux, Lens; Francis Petit, Villenuve D'Ascq; Jean M. Fuchs, Bouvigny Boyeffles, and André Mortreux, Hem, all of France, assignors to Norsolor, Cedex, France

Filed Jun. 22, 1989, Ser. No. 369,229

Claims priority, application France, Jun. 23, 1988, 88 08447

Int. Cl.[5] C25C *1/00*; C25F *5/00*

U.S. Cl. 204—59 M 14 Claims



1. A process for the preparation of a catalytic composition for the polymerization of olefins comprising:

at least partial electrochemical oxidation of aluminum in a solvent of at least one α,ω-dihalogenalkane, and

simultaneously the electrochemical reduction of a compound of titanium (IV).

5,068,015

ELECTROCHEMICAL PROCESS FOR THE PRODUCTION OF CHROMIC ACID

Hans-Dieter Block; Norbert Lönhoff, both of Leverkusen; Bernd Makowka; Helmut Klotz, both of Bergisch Gladbach; Rainer Weber, and Bernhard Spreckelmeyer, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1989, Ser. No. 393,733

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829121

Int. Cl.[5] C25B *1/22*

U.S. Cl. 204—89 10 Claims

1. In a process for the production of chromic acid by multistage electrolysis of dichromate solutions, monochromate solutions, or mixture of dichromate and monochromate solutions in two-compartment electrolysis cells, comprising an anode compartment and a cathode compartment, of which the anode and cathode compartments are separated by cation exchanger membranes, at temperatures in range from 50° to 90° C., wherein the dichromate solutions, or monochromate solutions, or mixture of dichromate and monochromate solutions are obtained by the digestion of chrome ores and leaching, wherein the improvement comprises (a) adjusting the pH of the monochromate solution obtained after leaching at 20° to 110° C. to a pH value of from 8 to 12 by the addition or in situ formation of carbonate in a quantity of from 0.1 to 0.18 mol/l for 300 to 500 g/l Na_2CrO_4, (b) separating the precipitated carbonates or hydroxides, (c) concentrating the solution to a content of 750 to 1000 g/l Na_2CrO_4, (d) converting with CO_2 under pressure into a dichromate-containing solution, (e) introducing the dichromate-containing solution into the anode compartment of the first stage electrolysis cell, (f) withdrawing an anolyte containing chromic acid in the last stage electrolysis cell, in which the molar ratio of Na^+-ions to chromic acid is from 0.41:0.59 to 0.35:0.65, and evaporating water from the said anolyte in vacuo in the temperature range of 55° to 80° C., crystallizing chromic acid, and separating chromic acid crystals from the said anolyte.

5,068,016

Patent Not Issued For This Number

5,068,017

METHOD TO DISSOLVE SOLID IRON OXIDES

Robert S. Boiko, 4200 W. Lake Ave., Apt. 306-C, Glenview, Ill. 60025

Continuation-in-part of Ser. No. 402,869, Sep. 5, 1989. This application May 17, 1991, Ser. No. 702,250

Int. Cl.[5] C25F *1/06*

U.S. Cl. 204—145 R 20 Claims

1. A method of dissolving solid iron oxide comprising providing an electrolyte of water and not less than about 14% by volume phosphoric acid or not less than 12% by weight citric acid or a combination thereof, the balance water in contact with an anode and a cathode of the solid iron oxide to be dissolved, and applying a direct negative current of not less than about 12 milliamps between the solid iron oxide cathode and an anode for a time sufficient to dissolve a portion of the solid iron oxide.

5,068,018

ELECTROPHORETIC FLUID COMPOSITE STRUCTURE

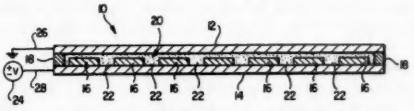
J. David Carlson, Cary, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Jan. 10, 1990, Ser. No. 463,276

The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.

Int. Cl.[5] C25B *7/00*

U.S. Cl. 204—180.1 19 Claims



18. A method for controlling the stiffness of a composite structure having spaced, parallel conductive layers, said method comprising the steps of placing an insulating material having spaced raised surfaces on at least one of said layers, confining an electrophoretic fluid in a space between said layers, said fluid being separatable into particle-rich and particle-deficient phases in the presence of an electric field, and applying an electric field to said fluid a first direction for causing said particle-rich phase to collect on one of said layers and engage the spaced raised surfaces of another of said layers, thereby coupling said layers and increasing the stiffness of said structure.

5,068,019

ELECTROPHORESIS FILM SUPPORT

Takashi Yoshida; Tsueno Kawase, and Nobuo Hiratsuka, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami, Japan

Filed May 18, 1990, Ser. No. 525,963

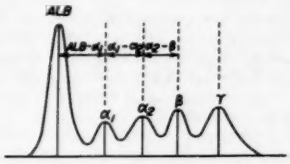
Claims priority, application Japan, May 19, 1989, 1-126286; May 19, 1989, 1-126287

Int. Cl.[5] C25B *1/00, 7/00*; B01D *61/42*

U.S. Cl. 204—182.8 9 Claims

1. An electrophoresis film support for analysis of serum protein comprising a microporous polymer membrane sheet containing therein an additive which is selected from the group consisting of hydroxypropyl cellulose, triphenyl phosphate, tricresyl phosphate and mixtures thereof, and having the prop-

erty that when used for serum protein analysis with a homogenous electrolyte buffer system which does not form a pH



gradient on the film, the sixth peak of β-lipoprotein does not appear to give a frction pattern having clear five fractions.

5,068,020

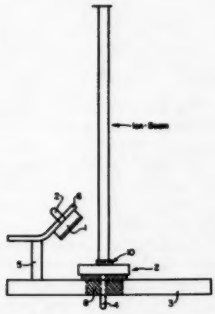
COATED SUBSTRATES AND PROCESS

Wei-kan Chu, and Charles B. Childs, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed Jul. 10, 1989, Ser. No. 377,444

Int. Cl.[5] C23C *14/46*

U.S. Cl. 204—192.11 **6 Claims**



1. A method for forming a gold film bonded to a diamond substrate which comprises:

(a) subjecting a surface of a diamond substrate to sputtering with a stream of ions of an inert gas at about room temperature and under vacuum, said ions having sufficient force and energy to substantially change the surface characteristics of said substrate, and

(b) subsequently exposing a film-forming material which is gold to a stream of ions of an inert gas at about room temperature and under vacuum, said ions having sufficient energy to sputter the atoms of said filmforming material and to transmit the sputtered atoms to the substrate surface with sufficient force to form a gold film bonded to the diamond substrate.

5,068,021

DEVICE FOR COATING A POLYMETHYLMETHACRYLATE SUBSTRATE WITH ALUMINUM

Eggo Sichmann, Geinhausen; Wolf-Eckart Fritsche, Kleinostheim, and Jim Schlüssler, Gruendau, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Apr. 17, 1990, Ser. No. 510,043

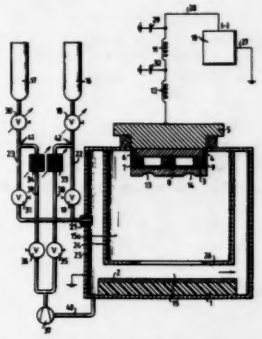
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1990, 4004116

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.14 **9 Claims**

1. Sputtering process for coating a plastic substrate with metal by means of a direct current source connected to an electrode connected to a target of said metal in an evacuable coating chamber, said process comprising the following steps during the sputtering of said target to coat said substrate:

a first coating step in which argon is introduced into said chamber and an argon plasma is ignited and maintained until the process passes from the oxidic phase to the metallic phase, whereupon said chamber is evacuated,



a second coating step in which helium is introduced into said chamber and a helium plasma is ignited and maintained until said substrate has a coating of sufficient thickness to protect said substrate against the ultraviolet radiation emitted during sputtering in an argon plasma, whereupon said chamber is evacuated, and

a third coating step in which argon is introduced into the coating chamber and an argon plasma is ignited and maintained until a desired coating thickness is attained.

5,068,022

PROCESS FOR SPUTTERING MULTILAYERS FOR MAGNETO-OPTICAL RECORDING

Peter F. Carcia, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1989, Ser. No. 441,499

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.15 **12 Claims**

1. An improved sputtering process for making a platinum/-cobalt multilayer film comprised of alternating layers of platinum and cobalt, the improvement comprising using krypton, xenon or a mixture thereof as the sputter gas.

5,068,023

ELECTRODE ARRANGEMENT

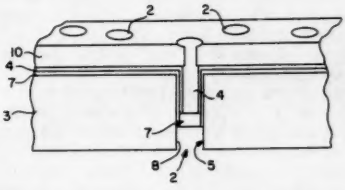
Tapio Toivanen, Kouhialankatu 50, SF-50100 Mikkeli, Finland

Continuation of Ser. No. 326,547, Feb. 21, 1989, abandoned. This application Jan. 17, 1991, Ser. No. 641,636

Claims priority, application Finland, Jun. 24, 1987, 872811

Int. Cl.[5] C23F *13/00*

U.S. Cl. 204—196 **3 Claims**



1. A cathodically protected rotatable suction roll, comprising a metal suction roll having a cylindrical shell formed with

a plurality of holes extending through the shell, an annular layer of insulation disposed on the outer surface of said roll, a layer of anodic metal disposed on the layer of insulation, said holes being exposed through said layers, an electrically insulating sleeve disposed in each hole in contact with the portion of the shell bordering the hole, each sleeve extending only a portion of the length of the hole, and an anode disposed in each sleeve and disposed out of direct electrical contact with said cylindrical shell, said anodes being connected to said layer of anodic metal, and means for connecting said layer of anodic metal in an electrical circuit with said cylindrical shell, electrolyte passing through said holes acting to complete an electrochemical circuit to thereby protect the portions of the shell bordering said holes from corrosion.

5,068,024

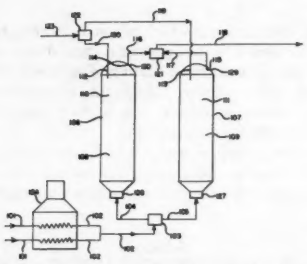
SLUDGE ADDITION TO A COKING PROCESS

Jon C. Moretta, Webster, Tex., and Robert D. Gombas, Jr., South Holland, Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 285,111, Dec. 15, 1988. This application Aug. 3, 1990, Ser. No. 562,620

Int. Cl.[5] C10G *9/14*

U.S. Cl. 208—13 **32 Claims**



1. A process for upgrading sludge comprising the steps of:

A. passing a feedstock comprising residual oil into a coking zone containing a low velocity vapor phase having a superficial vapor velocity of not more than about 10 feet per second, at coking conditions during a coke production cycle, to produce solid coke and vapor products; and

B. injecting a separate sludge stream into said low velocity vapor phase in the substantial absence of solid coke and coking foam produced from said feedstock, and contacting said sludge with vapor products at thermal treatment conditions to effect vaporization of at least a portion of the sludge.

5,068,025

AROMATICS SATURATION PROCESS FOR DIESEL BOILING-RANGE HYDROCARBONS

Opindar K. Bhan, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1990, Ser. No. 544,445

Int. Cl.[5] C10G *45/00*

U.S. Cl. 208—57 **15 Claims**

1. A process for the concomitant hydrogenation of aromatics and sulfur-bearing hydrocarbons in an aromatics- and sulfur-bearing hydrocarbon feedstock having substantially all of its components boiling in the range of about 200° F. to about 900° F. which process comprises:

(a) contacting at a temperature between about 600° F. and about 750° F. and a pressure between about 650 psi and about 2500 psi in the presence of added hydrogen said feedstock with a first catalyst bed containing a hydrotreating catalyst comprising nickel, tungsten and phosphorus on an alumina support, in which the nickel content ranges from 1 to 5 percent by weight of the total catalyst, measured as the metal, the tungsten content ranges from 10 to 35 percent by weight of the total catalyst measured as the metal and the phosphorus content ranges from 1 to 5 percent by weight of the total catalyst;

(b) passing the hydrogen and feedstock without modification, from the first catalyst bed to a second catalyst bed where it is contacted at a temperature between about 600° F. and about 750° F. and a pressure between about 600 psi and about 2500 psi with a hydrotreating catalyst comprising a hydrogenating metal component selected from cobalt, nickel and mixtures thereof, molybdenum and phosphorus on an alumina support, in which the hydrogenating metal component content ranges from 1 to 5 percent by weight of the total catalyst, measured as the metal, the molybdenum content ranges from 8 to 20 percent by weight of the total catalyst, measured as the metal and the phosphorus content ranges from 1 to 5 percent by weight of the total catalyst.

5,068,026

PROCESS FOR THE PRODUCTION OF NON-PUFFING SHAPED CARBON BODIES

Hubert Jäger, Biberbach-Eisenbrechtshofen, and Alfred Lorenz, Langweid, both of Fed. Rep. of Germany, assignors to SIGRI GmbH, Meitingen, Fed. Rep. of Germany

Filed Mar. 6, 1990, Ser. No. 489,192

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1989, 3907158

The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.

Int. Cl.[5] C10G *9/06*

U.S. Cl. 208—125 **11 Claims**

1. In a process for the production of graphitized carbon bodies from components consisting essentially of coal tar pitch coke and at least one cokable binder, by mixing to form a green mixture, shaping, coking and graphitization, the improvement which consists essentially of the step of adding at least one compound of metals selected from the group of alkaline earth metals consisting of magnesium, calcium, strontium and barium, said compound being at least partially soluble in the binder to at least one of the components of the green mixture before shaping, said added compound reducing the irreversible thermal expansion of the shaped bodies upon heating to temperatures about 1400° C.

5,068,027

PROCESS FOR UPGRADING HIGH-BOILING HYDROCARONACEOUS MATERIALS

Stephen C. Paspek, North Royalton; Jeffrey B. Hauser, Middleburgh Hgts.; Christopher P. Eppig, Cleveland Hts., and Harry A. Adams, Bedford, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 20, 1990, Ser. No. 482,255

Int. Cl.[5] C10G *9/26, 9/42*

U.S. Cl. 208—125 **43 Claims**

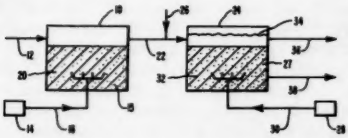
1. A process for upgrading a hydrocarbonaceous material having an initial boiling point at atmospheric pressure of at least about 625° F. to a product having a lower boiling point than the initial boiling point of said hydrocarbonaceous material and/or a higher boiling point than the final boiling point of said hydrocarbonaceous material, the process comprising heating a mixture comprising said hydrocarbonaceous material and at least one organic solvent in an enclosed space in the absence of externally supplied water or hydrogen at a temperature in the range of about 750° F. to about 1300° F. and a pressure in excess of about 1500 psig for an effective period of time to yield said product, said pressure being sufficient to maintain the specific gravity of the contents of said enclosed space in the range of about 0.05 to about 1.5,said organic solvent being capable of dissolving at least about 10 parts of said hydrocarbonaceous material per million parts of said organic solvent at the temperature wherein at least about 50% by weight of said organic solvent boils at atmospheric pressure.

5,068,028

MOLYBDENITE FLOTATION FROM COPPER SULFIDE/MOLYBDENITE CONTAINING MATERIALS BY OZONE CONDITIONING

Jan D. Miller; Yi Ye, both of Salt Lake City, Utah, and Woo-Hyuk Jang, Seoul, Rep. of Korea, assignors to University of Utah, Salt Lake City, Utah

Filed Jan. 21, 1990, Ser. No. 485,959
Int. Cl.[5] B03D *1/002, 1/02*
U.S. Cl. 209—167 **19 Claims**



1. A process for the recovery of molybdenite from a finely divided feed material containing one or more copper sulfides and molybdenite comprising;

(a) contacting the feed material with ozone,

(b) aerating an aqueous suspension of the ozone-treated feed material in the presence of a frother to float molybdenite and create a froth containing molybdenite on the surface of the suspension, and

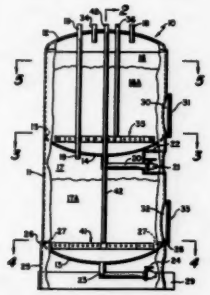
(c) recovering the froth from the surface of the suspension to form a molybdenite concentrate product, wherein the amount of ozone in step (a) is sufficient to inhibit the flotation of copper sulfides in the feed material upon aeration in step (b).

5,068,029

TWO-CHAMBER FLUID/SOLIDS TREATMENT VESSEL

Donald D. Tiggelbeck, Pittsburgh, Pa., and Samuel K. Patton, Heber Springs, Ak., assignors to Tigg Corporation, Pittsburgh, Pa.

Filed Feb. 20, 1990, Ser. No. 481,320
Int. Cl.[5] B01D *24/14*
U.S. Cl. 210—284 **16 Claims**



1. A vessel for contacting a fluid with particulate solids comprising a side wall, a top wall, a bottom wall and an intermediate wall which divides the interior of said vessel into an upper chamber and a lower chamber;

first solids loading conduit means to introduce particulate solids into said upper chamber to establish a first static bed of solids in said upper chamber; second solids loading conduit means to introduce particulate solids into said lower chamber to establish a second static bed of solids in said lower chamber;

first solids withdrawal conduit means for withdrawing particulate solids from said upper chamber; second solids withdrawal conduit means for withdrawing particulate solids from said lower chamber;

first fluid inlet conduit means for introducing fluid to be treated into the top portion of said upper chamber above the first static bed; second fluid inlet conduit means for introducing fluid to be treated into the top portion of said lower chamber above the second static bed;

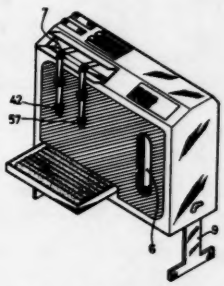
first fluid withdrawal conduit means including a first fluid collector adjacent to the intermediate wall for withdrawing fluid from the bottom of said first static bed in said upper chamber; second fluid withdrawal conduit means including a second fluid collector adjacent to said bottom wall for withdrawing fluid from the bottom of said second static bed in said lower chamber.

5,068,030

WATER FILTERING STERILIZING AND HEATING APPARATUS

Chi-Min Chen, Taipei Hsien, Taiwan, assignor to Oxford Science Industrial Co., Ltd., Taipei Hsien, Taiwan

Filed Nov. 9, 1990, Ser. No. 611,049
Int. Cl.[5] B01D *35/143, 35/06;* **C02F** *9/00*
U.S. Cl. 210—95 **5 Claims**



1. A water filtering, sterilizing and heating apparatus for coupling to a source of tap water, comprising:

a housing;

a filter tank disposed within said housing coupled to said source of water, said filter tank including activated carbon for removing odors and impurities from water passing therethrough;

a microwave oscillator disposed within said housing having an inlet coupled to an outlet of said filter tank for vibrating and churning water passing therethrough;

a vertically directed sterilizing tank disposed within said housing having a cylindrically shaped outer wall and an inlet disposed at a lower portion of said sterilizing tank, said sterilizing tank inlet being coupled to an outlet of said microwave oscillator, said sterilizing tank including (1) an ultra-violet lamp positionally located centrally therein and extending in said vertical direction, (2) a ridge member helically formed on in inner surface of said outer wall for directing the flow of water through said sterilizing tank to an outlet disposed at an upper portion of said sterilizing tank, and (3) a deflection member disposed adjacent said inlet of said sterilizing tank for directing water entering said sterilizing tank to said helical ridge member, whereby water flowing through said sterilizing tank spirals about said ultra-violet lamp;

cold water discharge means coupled to said outlet of said sterilizing tank for supplying substantially unheated water from said sterilizing tank, said cold water discharge means including a first faucet coupled to said outlet of said sterilizing tank; and,

hot water discharge means coupled in parallel comunication with said cold water discharge means for supplying heated water from said sterilizing tank, said hot water discharge means including (1) a storage tank disposed

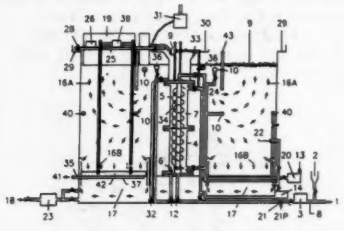
within said housing being fluidly coupled to said outlet of said sterilizing tank, (2) valve means for controlling the flow of water into said storage tank responsive to a fluid level therein, (3) means for heating water within said storage tank to a predetermined temperature, and (4) a second faucet coupled to an outlet of said storage tank.

5,068,031

SLUDGE TREATMENT APPARATUS

Lawrence K. Wang; Mu H. S. Wang, both of Latham; Chong S. Hwang, Flushing, and Harold Rhow, Hartsdale, all of N.Y., assignors to Int'l Environmental Systems, Inc., Pittsfield, Mass. and Globe Environmental Protection, Inc., Flushing, N.Y.

Filed Jul. 6, 1990, Ser. No. 549,413
Int. Cl.[5] C02F *11/14*
U.S. Cl. 210—96.1 **3 Claims**



1. An apparatus for treating liquid sludge, comprising in combination:

an inlet pipe with an in-line static mixing member for introducing said liquid sludge into said apparatus,

means for feeding chemical to said inlet pipe carrying said liquid sludge,

a built-in flotation monitor monitoring pH, streaming current, suspended solids, turbidity, and optical density for and adjusting the feeding of said chemical,

a cylindrical outer tank having the bottom thereof as an outside wall of said apparatus,

means for connecting said flotation monitor to said inlet pipe,

means for feeding pH buffer chemical to said inlet pipe in response to said flotation monitor,

a cylindrical inner pressure vessel disposed within said outer tank for flocculation, grit settling and gas dissolving,

means for introducing said liquid sludge tangentially into the top of the cylindrical inner pressure vessel to form a pressurized liquid sludge containing compressed gas for releasing by releasing means into said outer tank,

means for removing settled heavy silts, and sludges from the bottom of said pressure vessel,

a cylindrical inner porous tube positioned within said pressure vessel for gas dissolution under the pressure,

means for introducing gas to be pressurized through said inner porous tube into said pressure vessel for dissolving gas,

means for measuring the flow rates of said liquid sludge and various gases in said inlet pipe, pressure vessel, and other inlets or outlets,

releasing means for introducing the pressurized liquid sludge containing compressed gas to be depressurized and clarified from said pressure vessel into said outer tank for bubble generation and flotation-gravity clarification,

an influent distribution means for introducing non-pressurized liquid sludge into said outer tank for flotation-gravity clarification,

means for operating the flotation-gravity clarification under full flow pressurization mode, partial flow pressurization mode, recycle flow pressurization mode, or combinations thereof,

traveling sludge scooping means for removing floated sludge from the liquid surface of said outer tank,

sludge hopper and traveling scraper blade means for removing settled, heavy sludges from the bottom of said outer tank,

sludge discharge means for transporting said floated sludge and settled sludge through a sludge collection member to a dewatering device,

a recycle tank over the bottom of said outer tank for collection of flotation-gravity clarified effluent and for partial recirculation of clarified effluent,

an outlet for discharging said flotation-gravity clarified water from said recycle tank to an in-line water treater and then to discharge as a treated effluent,

a moving carriage having a platform supported between the upper portion of the wall of said outer tank and the upper portion of the wall of said pressure vessel so as to hold said releasing means, sludge scooping and scraping means, and driving motors,

means for circular moving said moving carriage together with said releasing means, sludge scooping, and scraping means, and driving motors along outer and inner rails on said apparatus and around the vertical axis of said apparatus,

means for recycling a portion of water from said recycle tank or said flotation clarification effluent into said pressure vessel to form the liquid sludge to be pressurized, then depressurized and clarified, and

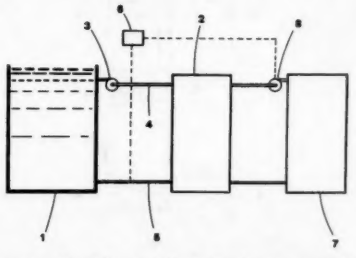
means for generating an electronic or magnetic field in the in-line water treater for control of biological fouling, scaling and corrosion.

5,068,032

SYSTEM FOR FIXING ANODIZED ALUMINUM

Giuseppe Garuti, No. 131 via Mantegna, 41100 Modena, Italy

Filed Jan. 22, 1990, Ser. No. 467,925
Claims priority, application Italy, Feb. 17, 1989, 40027 A/89
Int. Cl.[5] B05C *11/00*
U.S. Cl. 210—96.1 **4 Claims**



1. A system for fixing anodized aluminum, comprising:

a bath (1) of nickel fluoride solution in which items of anodized aluminum are immersed;

a tank (2), connected with the bath (1) by a flow pipeline (4) and a return pipeline (5) and said tank containing a negative ion exchange resin bed charged initially with fluorine ions;

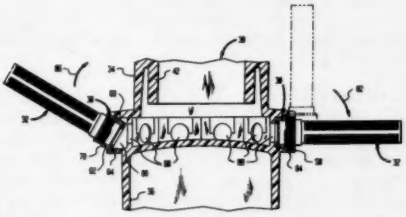
pump means (3) connected to said bath and said tank to recycle the solution contained in the bath by the flow line, the tank and the return line; and recharging means (7) connected to said tank to recharge the resin bed with fluorine ions when required.

5,068,033

UNDERDRAIN ASSEMBLY WITH PIVOTALLY-MOUNTED AND LOCKABLE LATERALS

Samuel Tobias, Edison, and Fred T. Hazlehurst, Union, both of N.J., assignors to Hayward Industries, Inc., Elizabeth, N.J.

Filed May 10, 1990, Ser. No. 521,610
Int. Cl.[5] B01D *35/31*
U.S. Cl. 210—169 16 Claims



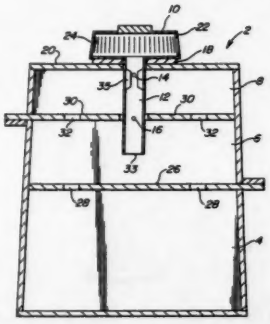
6. In combination, a swimming pool filter and an underdrain assembly contained within said filter, said underdrain assembly including a housing having a plurality of openings therein; a plurality of collecting means for collecting filtered water; a plurality of pivoting means for pivotally mounted said plurality of collecting means to said housing such that each of said collecting means is pivotable between a non-operating position, n which it is out of alignment with a corresponding one of said openings in said housing, and an operating position, in which it is in alignment with said corresponding one of said openings in said housing; and connecting means for releasably and threadedly connecting each of said collecting means to a corresponding one of said pivoting means, whereby each of said collecting means can be individually replaced without requiring removal of said underdrain assembly from said filter.

5,068,034

PURIFICATION UNDERDRAIN WITH MEANS TO COMPENSATE FOR FLOW AND PRESSURE DIFFERENCES BETWEEN LATERALS

Thomas P. Walter, Dallas, Pa., assignor to Unilift Corporation, Wilkes Barre, Pa.

Filed May 3, 1990, Ser. No. 518,687
Int. Cl.[5] B01D *24/46*
U.S. Cl. 210—232 65 Claims



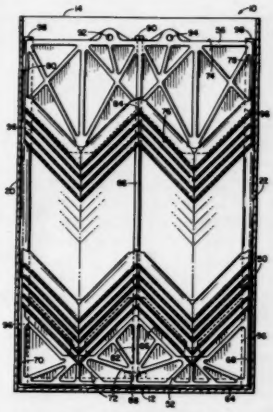
1. A liquid purification system comprising:
(a) a bed into which a liquid to be purified flows;
(b) a liquid purification media located in said bed;
(c) an underdrain placed in said bed beneath said purification media, said underdrain comprising a plurality of underdrain laterals laid laterally in said bed, each of said plurality of laterals being parallel and each of said laterals comprising:
(1) a gas chamber defined by surrounding walls;
(2) a means to cleanse said purification media during cleansing period using gas and backwash liquid introduced into said underdrain;
(3) a means to isolate said gas by from said backwash liquid and provide that only said gas occupies each of said gas chambers during said cleansing periods, said isolating means comprising each of said gas chambers and a means for injecting gas into each of said gas chambers;
(4) a means to compensate for differences in liquid pressures and flow during purification periods and said cleansing periods between said laterals and to equalize liquid distribution between said laterals.

5,068,035

COALESCING PLATE PACKING SYSTEM

Kirby S. Mohr, Jenks, Okla., assignor to Facet Quantek, Inc., Tulsa, Okla.

Filed Jan. 28, 1991, Ser. No. 647,501
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—236 22 Claims



1. A coalescing system for separating immiscible components of different densities mixed in a fluid comprising:
a vessel having a fluid inlet, a lighter component outlet and a heavier component outlet, the vessel having a bottom, opposed end walls, opposed paralleled sidewalls and an open top;
a coalescing stack formed of a plurality of vertically spaced apart coalescing plates positioned within said vessel, each coalescing plate having bi-directional corrugations running both laterally and longitudinally along the single plane of the plate forming crests and valleys, the crests and valleys including bleed holes for passage of the immiscible components;
a pair of bottom supports each having a flat bottom edge, an undulating upper edge conforming to said lateral corrugations of said coalescing plates, and having opposed paralleled sides, the spacing therebetween being slightly less than the spacing between said vessel sidewalls, the bottom supports being spaced apart from each other within said vessel and supporting said coalescing stack;
a pair of top supports each having an upper edge and an undulating bottom edge conforming to said lateral corrugations of said coalescing plates, and having opposed paralleled sides, the spacing between the sides being slightly less than the spacing between said vessel sidewalls, the top supports being spaced apart and positioned directly over said bottom supports in spaced apart planes; and

means of retaining said bottom supports, said coalescing stack and said top supports in an assembled package for insertion into and removal from said vessel.

5,068,036

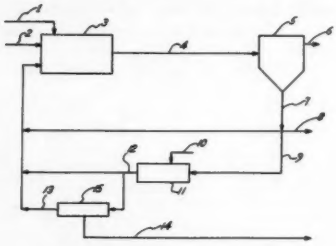
ACTIVATED SLUDGE PROCESS WITH IN SITU RECOVERY OF POWDERED ADSORBENT

Alan Y. Li, Burr Ridge, Ill.; James F. Grutsch, Hammond, Ind., and Kevin P. O'Leary, Orland Hills, Ill., assignors to Chemical Waste Management, Inc., Oak Brook, Ill.

Continuation-in-part of Ser. No. 291,061, Dec. 28, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 502,290

Int. Cl.[5] C02F *3/00, 3/08*

U.S. Cl. 210—606 **24 Claims**



1. An activated sludge process for the biological treatment of contaminated waste streams comprising, in combination, the steps of:

(a) contacting a contaminated waste stream with unregenerated recovered powdered adsorbent having adsorbed/absorbed thereon a substantial quantity of organic material from a previous contact with a contaminated waste stream and activated sludge comprising cellular microorganisms for a time sufficient to biologically degrade contaminates in the waste stream, thereby producing a decontaminated waste stream and a mixture of activated sludge and microorganism encapsulated powdered adsorbent;

(b) separating by gravity the activated sludge and the microorganism encapsulated powdered adsorbent from the decontaminated waste stream;

(c) lysing substantially all of the encapsulated powdered adsorbent to remove the microorganisms encapsulating the powdered adsorbent without desorption or destruction of the adsorbed/absorbed organic material to yield unregenerated recovered powdered adsorbent and cell lysate; and

(d) recycling the unregenerated recovered powdered adsorbent, activated sludge and the cell lysate for recontact with a contaminated waste stream, the unregenerated recovered powdered adsorbent not being subjected to a thermal regeneration process prior to recontact with the contaminated waste stream.

5,068,037

REMOVAL OF $FE^{(II)}$ FROM HYDROXYLAMINE SULFATE SOLUTION

Chin-Hsiung Chang, Palatine, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 29, 1990, Ser. No. 619,854

Int. Cl.[5] B01D *11/04, 15/04;* **C02F** *1/64*

U.S. Cl. 210—638 **9 Claims**

1. A process comprising purifying an aqueous solution of hydroxylamine sulfate containing about 5 to 100 wt. ppm (Fe(II) to provide an iron concentration suitable for preparing oxime compounds by contacting said solution with an effective amount of a non-polar solvent containing about 0.005 to 0.005 M of HPMTFP and about 0.0025 to 0.025M of TOPO at a pH above about 2.0 for a period of time sufficient to remove said Fe(II) to below 3 wt. ppm and thereafter separating said non-polar solvent.

5,068,038

METHOD OF LOWERING THE AOX CONTENT IN WATER

Joachim Fischer, Rodenbach, and Hubert Wolf, Hammersbach, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,081

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932174

Int. Cl.[5] C02F *1/28*

U.S. Cl. 210—662 **13 Claims**

1. A method of lowering the content of halo-organic pollutants in water, to residual AOX values below 1 mg organically bound halogen per liter, said method comprising adsorbing the halo-organic pollutants on iron (III) hydroxy complexes formed in situ by the hydrolysis of iron (III) salts in the presence of a further adsorption agent and separating the adsorption agents in flocculent form at pH 7 to 10, said method including determining the Fe^{2+} content; of the water, if necessary adjusting the Fe^{2+} content of the water to 20 to 1000 mg Fe^{2+} per liter water by addition of an iron (II) salt, adding an oxidation agent for converting Fe^{2+} into Fe^{3+}, after any adjustment of the Fe2+ content, in an amount at least sufficient for the oxidation of at least 20 mg Fe^{2+}/1 and at most sufficient for the oxidation of all the Fe^{2+}/1 present in the presence of any other components which can be oxidized practically instantaneously, in a manner similar to Fe^{2+} under the conditions of the reaction, the second adsorption means being a precipitated or pyrogenic silica having a specific surface of above 50 m^2/g and the amount of said second absorption means being 50 to 1000 mg/1 during the flocculation of the iron (III) hydroxy complexes.

5,068,039

METHOD AND DEVICE FOR DISPERSING IONS BY REMOTE ACTION

Jorge Cure, 8201 NW. 191 La., Miami, Fla. 33015; Panagiotis T. Pappas, Marcopuliotis 26, G-11744, Athens, Greece, and Harry Eichler, 5323 Hayes St., Hollywood, Fla. 33021

Filed Dec. 6, 1989, Ser. No. 446,984

Claims priority, application Greece, Sep. 20, 1989, 890100595

Int. Cl.[5] B01D *35/06*

U.S. Cl. 210—695 **4 Claims**

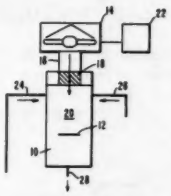
4. Method for dispersing or transporting ions and/or electrical charges inside materials by remote action, which comprises producing magnetic flux with a first electrically powered coil spaced from a material from which ions and/or electrical charges are to be dispersed or transported, surrounding the material with a second coil separated from said first coil by a plane perpendicular to a longitudinal axis of said first coil and connecting a short circuit across said second coil consisting of a diode for eliminating and/or smoothing the negative phase of the magnetic flux with the second coil.

5,068,040

DENSE PHASE GAS PHOTOCHEMICAL PROCESS FOR SUBSTRATE TREATMENT

David P. Jackson, Saugus, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 3, 1989, Ser. No. 332,124
Int. Cl.[5] C02F *1/32, 1/78;* B08B *3/12*
U.S. Cl. 210—748 15 Claims



1. A process for removing undesired material from a chosen substrate comprising the steps of:

(a) placing said substrate containing said undesired material in a cleaning vessel;

(b) contacting said substrate containing said undesired material with a chosen dense phase gas

above the critical pressure and critical temperature of said gas, said gas being capable of producing a cleaning effect to assist in the removal of said undesired material from said substrate;

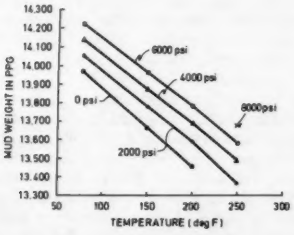
(c) exposing said substrate and said dense phase gas to radiation of a predetermined wavelength to produce a photochemical reaction that removes said undesired material from said substrate wherein said dense phase gas enhances the removal of said undesired material from said substrate.

5,068,041

OIL BASED SYNTHETIC HYDROCARBON DRILLING FLUID

Arvind D. Patel; Raymond E. McGlothlin; Roger D. Bleier, and H. N. Brinkley, all of Houston, Tex., assignors to M-I Drilling Fluids Company, Houston, Tex.

Continuation-in-part of Ser. No. 503,304, Mar. 30, 1990, abandoned. This application Jun. 8, 1990, Ser. No. 535,110
Int. Cl.[5] C09K *7/06*
U.S. Cl. 507—103 26 Claims



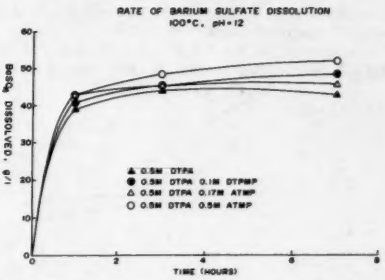
1. An improved continuous phase for an oil based drilling fluid, said continuous phase being characterized by minimal toxicity to plant and aquatic life and environmental compatibility, said continuous phase comprising a synthetic hydrocarbon oil, said synthetic hydrocarbon oil having an average molecular weight of from about 120 to about 1000, said synthetic hydrocarbon oil being synthesized from one or more olefinic monomers having a chain length of C_2 to C_{14}.

5,068,042

DISSOLUTION OF SULFATE SCALES

John Hen, Skillman, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 26, 1990, Ser. No. 558,957
Int. Cl.[5] E21B *43/12, 41/02*
U.S. Cl. 252—8.552 30 Claims



1. A composition for the removal of sulfate scale from surfaces comprising an aqueous solution of about 0.1 to 1.0 molar concentration of an aminopolycarboxylic acid (APCA) containing 1 to 4 amino groups or a salt thereof, and about 0.1 to 1.0 molar concentration of a second component which is diethylenetriaminepenta(methylenephosphonic acid) (DTPMP) or a salt thereof, or aminotri(methylenephosphonic acid) (ATMP) or a salt thereof as an internal phase enveloped by a hydrocarbon membrane phase which is itself emulsified in an external aqueous phase, said hydrocarbon membrane phase containing a complexing agent weaker for the cations of said sulfate scale than said APCA and DTPMP or ATMP, any complexing agent for said cations in said external aqueous phase being weaker than that in said hydrocarbon membrane phase.

5,068,043

PREFORMED SURFACTANT-OPTIMIZED AQUEOUS ALKALINE FLOOD

David R. Thigpen; Jimmie B. Lawson, and Richard C. Nelson, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 797,340, Nov. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 585,468, Mar. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 411,779, Aug. 26, 1982, abandoned. This application Aug. 9, 1989, Ser. No. 391,004
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—855.4 32 Claims

1. In a process for recovering oil from an acidic oil reservoir by injecting an aqueous alkaline solution comprising water, sodium chloride, and alkaline material for reacting with the reservoir oil forming a petroleum acid soap to form an in-situ surfactant system, the improvement comprising:

1) selecting a preformed cosurfactant which is soluble in both the aqueous solution and the reservoir oil and has a solubility ratio which is greater than the solubility ratio of the petroleum acid soap where the solubility ratio is the ratio of solubility in the aqueous alkaline solution to the solubility in the reservoir oil;

2) combining with the alkaline solution an amount of the preformed cosurfactant which will result in the in-situ surfacant system havng a salinity about equal to a salinity which results in minimal interfacial tension between the oil in the reservoir and the in-situ surfactant system at reservoir temperature, wherein the amount of the preformed cosurfactant is about 0.3 percent by weight in the aqueous alkaline solution; and

3) injecting the cosurfactant-aqueous alkaline solution mix-

ture into the reservoir to displace oil toward a fluid production location.

5,068,044

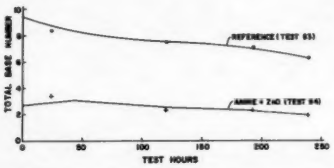
METHOD FOR REDUCING PISTON DEPOSITS

Darrell W. Brownawell, Scotch Plains; Warren A. Thaler, Flemington; Eric Bannister, Colts Neck, and Paul K. Ladwig, Randolph, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 269,274, Nov. 9, 1988, Pat. No. 4,906,389. This application Mar. 5, 1990, Ser. No. 488,194

Int. Cl.[5] C10M *129/28*

U.S. Cl. 252—25 **35 Claims**



1. A method for reducing piston deposits in an internal combustion engine lubricated with a lubricating oil containing a soluble weak base and circulating within the lubircation system of the engine which comprises

(a) circulating the lubricating oil to the piston ring zone of the engine where fuel combustion acids are introduced into the oil,

(b) contacting, at the piston ring zone, the combustion acids with from about 0.01 to about 3.0 wt.% of the weak base such that at least a portion of the acids are neturalized to form a soluble neutral salt containing the weak base and the combustion acids, wherein the weak base has a PKa ranging from about 4 to about 12,

(c) circulating the lubricating oil containing the soluble neutral salt to a heterogenous strong base immobilized within the lubrication system of the engine downstream of the piston ring zone, and

(d) contacting the soluble neutral salt with the heterogenous strong base, thereby causing at least a portion of the weak base in the salt to be displaced into the lubricating oil and resulting in the formation of a strong base/combustion acid salt which is immobilized with the heterogenous strong base,

wherein the heterogenous strong base is part of the oil filter system of the engine.

5,068,045

GREASE COMPOSITION CONTAINING ALKOXYLATED AMIDE BORATES

John P. Doner, Sewell; Andrew G. Horodysky, Cherry Hill, and John A. Keller, Jr., Pitman, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 511,803, Apr. 17, 1990, abandoned, which is a continuation of Ser. No. 57,155, May 4, 1987, abandoned, which is a continuation of Ser. No. 769,912, Aug. 27, 1985, abandoned. This application Oct. 10, 1990, Ser. No. 596,624

Int. Cl.[5] C10M *169/06*

U.S. Cl. 252—32.007 E **19 Claims**

1. An improved grease composition comprising a major portion of a lubricating component and:

(a) a means for elevating the dropping point of a grease comprising a compound prepared by reacting a boron compound with a hydroxyl-containing amide and

(b) a hydroxy-containing soap thickener.

5,068,046

LUBRICANT COMPOSITION COMPRISING AN OCTADECYLENE OXIDE POLYAMINE REACTION PRODUCT

David A. Blain, Mt. Laurel, and Angeline B. Cardis, Florence, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 460,691, Jan. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 276,010, Nov. 25, 1988, abandoned. This application Feb. 19, 1991, Ser. No. 657,287

Int. Cl.[5] C10M *133/08*

U.S. Cl. 252—51.5 A **16 Claims**

1. A lubricant composition consisting essentially of a major proportion of a lubricant and an antioxidant and dispersant amount of a reaction product obtained by reacting a linear, long chain octadecylene oxide with a polyamine which has the structural formula:

$$H_2N\left(R^5-N\right)_x R^6-NH_2$$
$$\quad\quad\quad

selected from primary amino groups, secondary amino groups and

(b) polyol,

(c) about C_{50} to about C_{400} hydrocarbyl substituted carboxylic acid component containing 1 to 2 carboxylic acid groups or anhydride group, and polyol, and

(d) polyamine having at least two reactive amino groups selected from primary amino groups, secondary amino groups and mixtures thereof, and about C_{50} to about C_{400} hydrocarbyl substituted carboxylic acid component containing 1 to 2 carboxylic acid groups or anhydride groups.

66. A lubricant composition exhibiting improved low temperature viscometric properties and dispersancy comprising:

(1) oleaginous material and

(2) multifunctional viscosity index improver comprised of reaction product of

(i) (a) molecular weight degrade ethylene-α-olefin copolymer obtained by degrading undegraded copolymer of ethylene and at least one other α-olefin monomer, said undegraded copolymer comprising intramolecularly heterogeneous copolymer chains containing at least one crystallizable segment of methylene units and at least one low crystallinity ethylene-α-olefin copolymer segment, wherein said at least one crystallizable segment comprises at least about 10 weight percent of said copolymer chain and contains at least about 5 weight percent ethylene, wherein said low crystallinity segment contains not greater than about 53 weight percent ethylene, and wherein said copolymer has a molecular weight distribution characterized by at least one of a ratio of M_w/M_n of less than 2 and a ratio of M_z/M_w of less than 1.8, and wherein at least two portions of an individual intramolecularly heterogeneous chain, each portion comprising at least 5 weight percent of said chain, differ in composition from one another by at least 7 weight percent ethylene, said degraded ethylene-α-olefin copolymer grafted with (b) ethylenically monounsaturated carboxylic acid material having 1 to 2 carboxylic acid groups or anhydride group to form grafted degraded ethylene copolymer; and

(ii) at least one of

(a) polyamine having at least two reactive amino groups selected from primary amino groups, secondary amino groups and mixtures thereof,

(b) polyol,

(c) about C_{50} to about C_{400} hydrocarbyl substituted carboxylic acid component containing 1 to 2 carboxylic acid groups or anhydride group, and polyol, and

(d) polyamine containing at least two reactive amino groups selected from primary amino groups, secondary amino groups and mixtures thereof, and about C_{50} to about C_{400} hydrocarbyl substituted carboxylic acid component containing 1 to 2 carboxylic acid groups or anhydride group.

5,068,048

LUBRICANTS AND LUBE ADDITIVES FROM EPOXIDATION OF LOWER OLEFIN OLIGOMERS

Catherine S. H. Chen, Berkley Heights, and Paul G. Rodewald, Rocky Hill, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 7, 1990, Ser. No. 476,079

Int. Cl.[5] C10M *145/00*

U.S. Cl. 252—52 A **8 Claims**

1. A process for the production of liquid lubricant or lubricant additive comprising;

contacting an oligomeric olefin and an epoxidizing agent under epoxidizing conditions, said olefin comprising the oligomerization product of lower olefin oligomerized in contact with medium pore, shape selective metallosilicate catalyst under oligomerization conditions;

separating the epoxidation reaction product and recovering said liquid lubricant or additive containing oxirane ring structure.

5,068,049

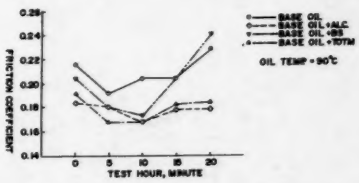
METHOD OF COLD ROLLING A METAL

Tsutomu Hatano; Sohei Kawasaki; Tetsuro Hoshino, all of Tokyo, and Takamitsu Endo, Yokahama, all of Japan, assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Dec. 29, 1987, Ser. No. 138,938

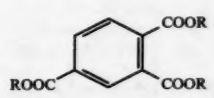
Int. Cl.[5] C10M *129/72*

U.S. Cl. 252—57 **8 Claims**



1. A method of cold rolling a metal which comprises

(a) applying to a metal a lubricant composition comprising a major amount of a lubricating oil basestock and from about 8 to about 15 wt. % of a tri-ester having the general formula



wherein R is an alkyl group having from 6 to 13 carbon atoms, and

(b) performing a cold rolling operation on said metal.

5,068,050

AMORPHOUS OXIDE MAGNETIC MATERIAL

Koichiro Inomata, Yokohama, and Susumu Hashimoto, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 15, 1988, Ser. No. 271,448

Claims priority, application Japan, Nov. 18, 1987, 62-289480; Dec. 11, 1987, 62-311879; Jan. 22, 1988, 63-10828; Feb. 19, 1988, 63-35155

Int. Cl.[5] C01F *17/00*; C01G *45/12*

U.S. Cl. 252—62.51 **18 Claims**

1. An amorphous oxide ferromagnetic material consisting essentially of the following components:

at least one element represented by Ln selected from the group consisting of Y and rare earth elements;

at least one element represented by A selected from the group consisting of Ca, Sr, Ba, and Pb; Mn;

at least one element represented by X selected from the group consisting of B, Bi, Si, Mg, Mo, V, Zn, P and Ge; and oxygen,

the proportions of said components corresponding to the formula:

$$(1-y)[Ln_{1-x}A_xMnO_{3-\delta}]\cdot y[XO]$$

wherein XO is an oxide of said X and is calculated in terms of B_2O_3, SiO_2, MgO, MoO_3, V_2O_5, ZnO, P_2O_5, or GeO_2, and δ is oxygen deficiency equal to or less than 1, x and y fall within the ranges of $0.1 \leqq x \leqq 0.8$ and $y \leqq 0.7$; respectively.

5,068,051

CLEANING SOLVENT

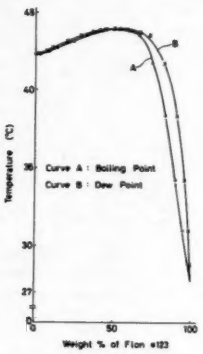
Hideaki Kikuchi; Motosuke Ogawa, both of Shimizu, and Akira Niiyama, Mitaka, all of Japan, assignors to Dupont-Mitsuj Fluorochemicals Co., Ltd. and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 454,265

Claims priority, application Japan, Dec. 29, 1988, 63-335030; Mar. 2, 1989, 1-50748

Int. Cl.[5] C11D *7/50, 7/32;* B01F *1/00*

U.S. Cl. 252—162 16 Claims



1. An azeotropic cleaning solvent composition, consisting essentially of a dichlorotrifluoroethane, selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,1-dichloro-1,2,2-trifluoroethane and 1,2-dichloro-1,1,2-trifluoroethane, and dimethoxymethane in a weight proportion of said dimethoxymethane to said dichlorotrifluoroethane in the range from 5:95 to 70:30, wherein said dichlorotrifluoroethane is present in an amount of from 5 percent to 70 percent by weight of the entire composition, wherein said composition has a boiling point of about 49.3° C. at 1 atmosphere of pressure.

5,068,052

RESIN COMPOSITION CONTAINING SMECTIC LIQUID CRYSTAL

Junji Watanabe, Yokohama; Michiro Naka, Fuji, and Kenji Hijikata, Mishima, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

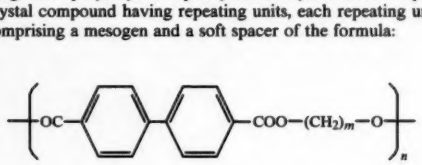
Filed Dec. 16, 1988, Ser. No. 285,424

Claims priority, application Japan, Dec. 25, 1987, 62-329237

Int. Cl.[5] C09K *19/52*

U.S. Cl. 252—299.01 10 Claims

1. A resin composition capable of undergoing melt processing to form improved shaped articles comprising 100 parts by weight of a thermoplastic polymer which is incapable of assuming a smectic liquid crystal state selected from the group consisting of polyoxymethylene and a liquid crystal polyester containing recurring oxybenzoyl units and 0.01 to 50 parts by weight of a polyalkylene biphenyldicarboxylate smectic liquid crystal compound having repeating units, each repeating unit comprising a mesogen and a soft spacer of the formula:



where m is 2 to 10 and n is at least 2, said polyalkylene biphenyldicarboxylate smectic liquid crystal compound being incorporated in intimate admixture throughout said thermoplastic polymer.

5,068,053

ETHYNE DERIVATIVES AS A COMPONENT OF LIQUID CRYSTAL PHASES

Volker Reiffenrath, Rossdorf; Eike Poetsch, Mühltal; Joachim Krause, Dieburg, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/DE88/00136, § 371 Date Nov. 25, 1988, § 102(e) Date Nov. 25, 1988, PCT Pub. No. WO88/07523, PCT Pub. Date Oct. 6, 1988

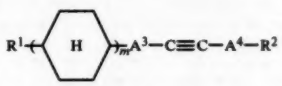
PCT Filed Mar. 10, 1988, Ser. No. 279,594

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710069

Int. Cl.[5] C09K *19/34;* C07D *239/02*

U.S. Cl. 252—299.61 6 Claims

1. An ethyne derivative of Formula I



I

wherein

R^1 and R^2 in each case independently of one another are straight-chain alkyl, alkoxy, or oxaalkyl having 1 to 15 C atoms;

m is 1 or 1; and

A^3 and A^4 are each independently 1,4-phenylene, pyridine-2,5-diyl, or pyrimidine-2,5-diyl,

with the proviso that only one of the groups A^3 and A^4 is pyridine2,5-diyl or pyrimidine-2,5-diyl.

5,068,054

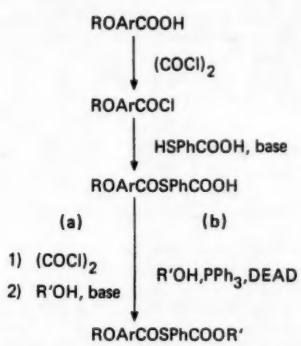
FERROELECTRIC LIQUID CRYSTALS

Kathleen M. Betterton, San Jose; William D. Hinsberg, Fremont, both of Calif.; Huu T. Nguyen, Pessac, France; Wing T. Tang, and Robert J. Twieg, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,589

Int. Cl.[5] C09K *19/32;* C07C *67/02*

U.S. Cl. 252—299.62 5 Claims



1. A ferroelectric liquid crystal of the formula: $H(CH_2)_nOArCOSPhCOOC^*H(CH_3)(CH_2)_{m-2}H$ where n is in the range 8–16, m is in the range 4–8, is selected from the group consisting of 2,6-naphthyl, 4,4'-biphenyl, and 4,4'-diphenylethane, and Ph is 1,4-phenylene.

5,068,055

EUROPIUM ACTIVATED STRONTIUM TETRABORATE UV PHOSPHORS

Charles F. Chenot, Towanda, Pa., and Michael A. Krebs, Waverly, N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 232,031, Aug. 15, 1988, abandoned, which is a continuation of Ser. No. 194,245, May 16, 1988, abandoned, which is a continuation of Ser. No. 74,830, Jul. 17, 1987, abandoned, which is a continuation of Ser. No. 903,181, Aug. 28, 1986, Pat. No. 4,719,033. This application Feb. 25, 1991, Ser. No. 659,489

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[5] C09K *11/63*

U.S. Cl. 252—301.4 R **2 Claims**

1. A europium activated strontium tetraborate UV emitting phosphor having a composition in percent by weight of from about 34.72 to about 35.80 strontium, from about 17.66 to about 17.78 boron, from about 0.37 to about 1.86 europium, and the balance oxygen, and having particles in the shape of essentially elongated prism-like particles with the europium relatively uniformly distributed throughout the balance of said phosphor and with the particle size distribution being characterized by the 50% size being in the range of from about 7 micrometers to about 12 micrometers as determined by Coulter Counter measurement and with less than about 12% by weight of the particles having a particle size of greater than about 16 micrometers as determined by Coulter Counter measurement, said phosphor being produced by, a process comprising the steps of forming a suspension of strontium carbonate and europium oxide in an aqueous solution of boric acid wherein said boric acid causes slow etching of said strontium carbonate and said europium oxide, digesting said suspension to form a strontium borate hydrate intermediate, said intermediate having a relatively homogeneous particle size, said relatively homogeneous particle size resulting from said slow etching, removing the liquor from said intermediate, drying said intermediate, and firing said intermediate to form said phosphor wherein said homogeneous particle size of said intermediate results in said particle size distribution in said phosphor and wherein said process steps result in said shape of said phosphor particles.

5,068,056

AQUEOUS DISPERSIONS OF ACICULAR TITANIUM DIOXIDE

Jenifer L. Robb, Stockton on Tees, England, assignor to Tioxide Group PLC, England

Filed Dec. 1, 1989, Ser. No. 444,811

Claims priority, application United Kingdom, Dec. 16, 1988, 8829402

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—313.1 **34 Claims**

1. An aqueous dispersion of titanium dioxide comprising water, particles of titanium dioxide having an acicular shape and a dispersing agent selected from the group consisting of polymers or copolymers of an acrylic acid or substituted acrylic acid and salts of said polymers or copolymers and said titanium dioxide being present in an amount to produce a solids content for the dispersion of from 20 to 60 percent by weight and having a size such that the dispersion is substantially transparent to visible light and has a maximum extinction coefficient (E(max)) in the ultra violet range of wavelengths of at least 30 liters per gm per cm.

5,068,057

CONVERSION OF CARBON DIOXIDE TO CARBON MONOXIDE

Bruce L. Gustafson, and James V. Walden, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 364,755, Jun. 12, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 565,838

Int. Cl.[5] C01B *3/40, 3/38*

U.S. Cl. 252—373 **14 Claims**

1. Process for the continuous preparation of a mixture of hydrogen and carbon monoxide in a mole ratio of about 1:1.5 to 2:1 which comprises continuously contacting a substantially anhydrous feed mixture consisting essentially of carbon dioxide and at least one hydrocarbon with a fixed bed of a supported catalyst consisting essentially of 0.1 to 2 weight percent, based on the weight of the catalyst, of a metal selected from platinum or palladium on an alumina or silica-alumina support at a temperature of about 650° to 1000° C. at a gas hourly space velocity of about 100 to 50,000; wherein

(1) the hydrocarbon has the empirical formula C_nH_{2n} or $C_{n'}H_{2n'+2}$ wherein n is 2 to 6 and n' is 1 to 6;

(2) wherein the mole ratio of carbon dioxide to

$$\frac{\text{moles hydrocarbon}}{n} \text{ or } \frac{\text{moles hydrocarbon}}{n'}$$

mixture is about 1:2 to 2:1.

5,068,058

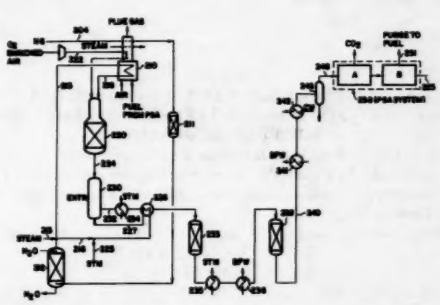
PRODUCTION OF AMMONIA SYNTHESIS GAS

Joseph P. Bushinsky, Allentown; David M. Nicholas, New Tripoli; Shoou-I Wang, and Nitin M. Patel, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 4, 1989, Ser. No. 347,609

Int. Cl.[5] C01C *1/04*

U.S. Cl. 252—376 **13 Claims**



1. In the production of ammonia synthesis gas, the method which comprises:

(a) introducing a first portion of a preheated hydrocarbon vapor charge rich in methane into an autothermal reactor together with steam and oxygen-enriched air, thereby inducing combustion of part of the introduced hydrocarbon charge and elevating the temperature to effect oxidation of said first hydrocarbon charge with resulting formation of hydrogen and oxides of carbon;

(b) introducing a second portion of the preheated hydrocarbon vapor charge together with added steam into one end of a heat exchange reactor;

(c) discharging the reaction product from said autothermal reactor directly into the other end of said heat exchange reactor, to flow therethrough countercurrently to said second portion of hydrocarbon vapor charge and in indirect heat exchange therewith, whereby said second portion of the hydrocarbon charge is brought to an elevated

temperature effective for reaction of said second hydrocarbon portion with steam;

(d) mixing the product of the steam-reacted second portion of hydrocarbon charge with the reaction product from said autothermal reactor within said heat exchange reactor to effect direct heat exchange therebetween and discharging the obtained reformate mixture from said heat exchange reactor;

(e) cooling the discharged mixture and subjecting the same to shift reaction in the presence of steam to effect conversion of contained carbon monoxide to carbon dioxide with accompanying release of additional hydrogen; and

(f) cooling the shift reaction product to a temperature level effective for condensation of contained water and separating the resulting condensed water from said shift reaction product to yield a cooled gas stream comprising hydrogen, nitrogen, and carbon dioxide.

5,068,059

CORROSION INHIBITOR

Winston S. Go, Randolph; Joseph S. Roti, West Milford; Mark G. Lang, Wayne, and Charles O. Weiss, Plainsboro, all of N.J., assignors to Drew Chemical Corporation, Boonton, N.J.

Filed Jan. 16, 1990, Ser. No. 465,279

Int. Cl.[5] C23F *11/10*

U.S. Cl. 252—389.53 **3 Claims**

1. A composition for use in inhibiting the corrosion of mild steel surfaces in an alkaline cooling water system in which the active components are (a) hydroxyphosphonoacetic acid, or a water soluble salt thereof, and (b) an aminoalkylenephosphonic acid derivative, or a water soluble salt thereof, the latter in combination with a manganese compound, said components (a) and (b) being in a weight ratio of about 1:10-10:1.

3. A method of inhibiting the corrosion of mild steel surfaces in an alkaline cooling water system which comprises incorporating in the system an effective amount of a composition according to claim 1.

5,068,060

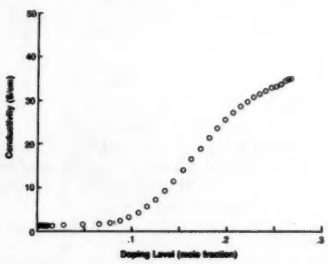
NEUTRAL AND ELECTRICALLY CONDUCTIVE POLY(HETEROCYCLIC VINYLENES) AND PROCESSES FOR PREPARING SAME

Kwan-Yue A. Jen, Flanders; Ronald L. Elsenbaumer, Morristown, and Lawrence W. Shacklette, Maplewood, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

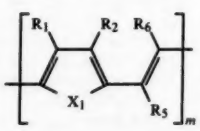
Division of Ser. No. 894,172, Aug. 7, 1986. This application May 7, 1990, Ser. No. 520,499

Int. Cl.[5] H01B *1/00, 1/06*

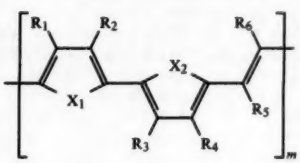
U.S. Cl. 252—500 **32 Claims**



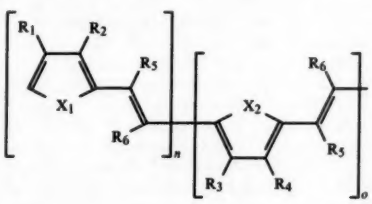
1. An electrically conductive polymer comprising a polymer which comprises recurring units selected from the group consisting of those of the following formulae VIII–XIV:



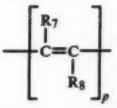
VIII

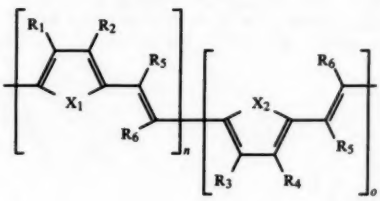


IX

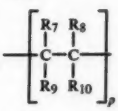


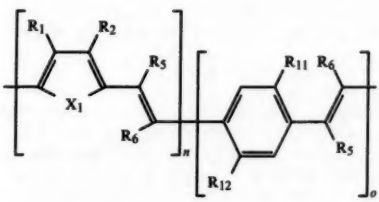
X



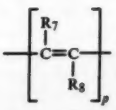


XI





XII



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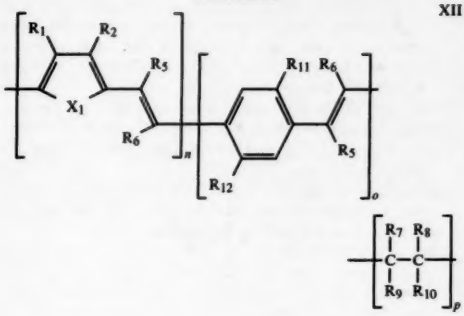
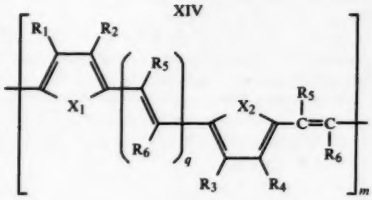
XII



and

XIV



wherein:

m, and the sum of n, o, and p, are the same or different and are natural numbers greater than about 100;

q is a natural number from 0 and 4;

R_1 to R_{14} are the same or different at each occurrence and are hydrogen, alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkylaryl, arylalkyl, cycloalkyl, alkylsulfinyl, alkylsulfonyl, arylalkylamino, aryl arylthio, alkylamino, dialkylamino, arylamino, diarylamino, cycloalkenyl, arylsulfinyl, arylsulfonyl, or alkyl substituted with a sulfonic acid, halo, nitro, amino, cyano, carboxylic acid, phosphoric acid or epoxy moiety or any of

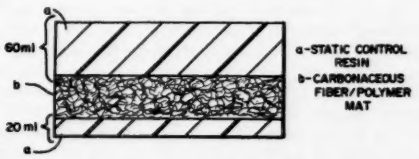
X_1 and X_2 are the same or different and are divalent S, O, Se, NR_{15} or PR_{15}, wherein R_{15} is hydrogen, alkyl, alkyaryl, arylalkyl, or aryl, doped with a dopant.

5,068,061

ELECTROCONDUCTIVE POLYMERS CONTAINING CARBONACEOUS FIBERS

Thomas M. Knobel, Hackensack, N.J.; Francis P. McCullough, Jr., Lake Jackson, and Lance L. Black, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 8, 1989, Ser. No. 447,990
Int. Cl.[5] H01B *1/06*; D02G *3/00*
U.S. Cl. 252—511 **22 Claims**



1. In a composition comprising a thermoplastic electroconductive resin matrix containing a multiplicity of reinforcing carbonaceous fibers, the improvement which comprises said reinforcing fibers comprising resilient shaped reforming elongatable non-linear non-flammable conductive carbonaceous fibers, the fibers having a reversible deflection ratio of greater than 1.2:1 and an aspect ratio (l/d) of greater than 10:1 and said resin matrix containing from about 0.5 to about 40 percent by weight, based on the composition, of the carbonaceous fibers.

5,068,062

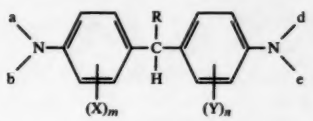
REVERSIBLY COLOR-CHANGEABLE MATERIALS

Hiroo Inata; Shunichi Matsumura; Seiji Itoh, and Masuhiro Okada, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 5, 1989, Ser. No. 333,257
Claims priority, application Japan, Apr. 7, 1988, 63-84173; Jun. 13, 1988, 63-143538; Sep. 9, 1988, 63-224752; Oct. 19, 1988, 63-261631; Nov. 7, 1988, 63-279477
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—518 **20 Claims**

1. An electrochromic resin composition comprising

(a) 100 parts by weight of a network comprising a crosslinked polymer containing bonded units represented by the following formula (I)



(I)

wherein R represents a hydrogen atom or a monovalent hydrocarbon group selected from the group consisting of alkyl, aralkyl, cycloalkyl and aryl groups, X and Y, independently from each other, represent a halogen atom, a nitro group, a monovalent hydrocarbon group selected from the group consisting of alkyl, aralkyl, cycloalkyl and aryl groups or a monovalent hydrocarbon-O-group wherein the monovalent hydrocarbon is selected from the group consisting of an alkyl, aralkyl, cycloalkyl and aryl groups, m and n, independently from each other, represent 0, 1, 2, 3 or 4, a, b, d and e are bonds which, independently from each other, are bonded to a hydrogen atom or to an aliphatic or alicyclic carbon, provided that at least one of these bonds is bonded to the aliphatic or alicyclic carbon,

in a form in which the amino groups in the formula are quaternized, and

(B) 5 to 150 parts by weight of an electrolytic material uniformly dispersed in the network (A) wherein the electrolyte is an alkali metal salt or an ammonium salt of an organic or inorganic acid.

5,068,063

NON-CARBON BLACK CONTAINING CONDUCTIVE COATING COMPOSITION

Henry S. Tremper, III, Clayton, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1989, Ser. No. 461,471
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—518 **7 Claims**

1. A conductive coating composition comprising solvent and 40–75% by weight of film forming binder and pigment in a pigment to binder weight ratio of about 1:100 to 100:100; wherein the binder consists essentially of about

(A) 40–70% by weight, of a hydroxy containing polyester resin having a linear polyester segment with hydroxyl groups and branched polyester segments attached to the linear segment having hydroxyl groups and the polyester resin has a number average molecular weight of about 800–3,500 and a hydroxyl number of about 50–170 and

(B) 30–60% by weight of an aminoplast crosslinking agent;

wherein the pigment comprises an electrically conductive pigment that comprises silica selected from the group consisting of amorphous silica or a silica containing material selected from the group consisting of metal silicates, silica containing glass and material having an extensive co-valent network of SiO_4 units; said silica being in association with a two-dimensional network of antimony-containing tin oxide crystallites in which the antimony content ranges from about 1-30% by weight of the tin oxide and the composition forms a coating having a surface conductivity of at least 100 Ransburg units.

5,068,064

N-SUBSTITUTED LAURAMIDES, THEIR PREPARATION AND COMPOSITIONS IN WHICH THEY ARE PRESENT

Vincenzo Proietto, Saint Georges D'Orques, and Ali Salhi, Saint Gely du Fesc, both of France, assignors to Sanofi, Paris, France

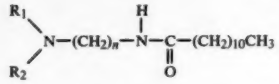
Filed Jun. 7, 1990, Ser. No. 534,497

Claims priority, application France, Jun. 8, 1989, 89 07619

Int. Cl.[5] C09F *7/00*

U.S. Cl. 260—404.5 **10 Claims**

1. An aminoalkylauramide of the formula



(I)

in which R_1 is a benzyl group and R_2 is an alkyl having from 1 to 4 carbon atoms, or R_1 and R_2 form a 4-benzylpiperidino group with the nitrogen atom to which they are bonded, and n=2 to 6, or one of its salts with organic or mineral acids.

5,068,065

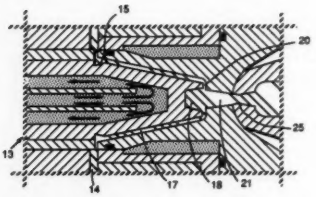
FASTER CYCLING SPRUE METHOD AND APPARATUS FOR INJECTION MOLDING PLASTIC OPTICAL DISKS

Steven M. Maus, Osseo, and George J. Galic, Columbia Heights, both of Minn., assignors to Galic Maus Ventures, Columbia Heights, Minn.

Filed Jul. 31, 1990, Ser. No. 563,659

Int. Cl.[5] B29C *45/27, 45/38;* **B29D** *17/00*

U.S. Cl. 264—1.3 **31 Claims**



1. A method of injection molding plastic optical disks in a moldset maintained in fluid communication through a nozzle tip with an injection molding machine at least while plastic melt flow into the moldset is desired,

the moldset containing a sprue bushing assembly having a female member and a male member co-axially aligned with the nozzle tip so as to form a melt passageway from the nozzle tip on an upstream end to an annular gate to a disk mold cavity on a downstream end such that the melt passageway between its ends defines a length and a shape of a sprue to be formed between the nozzle tip on the upstream end to the annular gate to a disk mold cavity on the downstream end,

the male member having a spreader die contour of a generally conically-tipped torpedo-shape, the male member protruding substantially into the female member cavity's length and the male member being separated from the female member cavity in a first position to form at least substantially upstream from the gate an annular open aperture between the male and female members wherein a hollow sprue may be molded, the hollow sprue having both inside and outside surfaces,

the male and female members being capable of axial motion therebetween to a second position of the moldset wherein the male and female members are less separated than in the first position,

and at least the male member being maintained at a temperature below the solidification temperature of the plastic by a mass transport cooling mechanism,

comprising the steps of:

(a) injecting plastic melt into the moldset in the first position to form the molten hollow sprue and disk therein;

(b) urging together axially the male and female members while the hollow sprue is still molten until the second position of the moldset is reached, wherein the male and female members are less separated than in the first position,

(c) cooling the molten hollow sprue by concurrent contact on the inside surface with the male member and contact on the outside surface with the female member, while concurrently the molten disk is also being cooled to below its solidification temperature;

(d) ejecting the molded hollow sprue and solidified disk out of the moldset.

5,068,066

PROCESS AND APPARATUS FOR PRODUCING PROPELLANT CHARGE GRANULAR MATERIAL

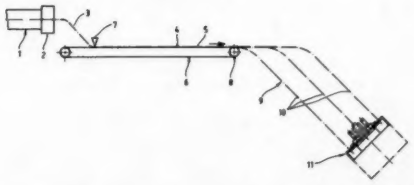
Dietmar Müller, Karlsruhe, and Helmut Bauer, Malgersdorf, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 310,919

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1988, 3805317

Int. Cl.[5] C06B *21/00*

U.S. Cl. 264—3.3 **8 Claims**



1. Process for producing propellant charge granular material from small diameter propellant charge strands, whereof a plurality is continuously extruded, separately placed on a support behind an extruder and are supplied by means of the latter to a cutting plate with revolving cutting blades positioned behind it and by which they are cut to length, characterized in that the support forms a setting zone for the propellant strands and that the latter are transferred by the support to a sloping zone and on the latter are supplied to the cutting plate with a number of guide holes corresponding to the number of stands and on passing out of the guide holes are simultaneously cut to the desired short length the cutting blades rotating behind the cutting plate.

5,068,067

EMULSIFIER FOR MICROCAPSULES, MICROCAPSULES USING SAID EMULSIFIER AND PROCESS FOR PRODUCING SUCH MICROCAPSULES, AND NON-CARBON PRESSURE-SENSITIVE COPYING PAPER USING SAID MICROCAPSULES

Akira Kawai, and Yoshihide Murakami, both of Takasago, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Oct. 18, 1989, Ser. No. 423,188

Claims priority, application Japan, Oct. 17, 1988, 63-262148; Oct. 18, 1988, 63-263745; May 15, 1989, 1-121314; May 15, 1989, 1-121315; May 15, 1989, 1-121316

Int. Cl.[5] B01J *13/18*

U.S. Cl. 264—4.7 6 Claims

1. A process for producing microcapsules which comprises the steps of

(1) combining in an aqueous medium an aminoaldehyde polycondensate as wall film material and a water-soluble high polymeric substance which is a copolymer selected from the group consisting of:

(a) benzyl (meth) acrylate (A), styrene (C), maleic anhydride (D);

(b) diisobutylene (B), styrene (C), maleic anhydride (D); and

(c) benzyl (meth)acrylate (A), diisobutylene (B), styrene (C), maleic anhydride (D) to obtain an emulsion of desired average particle size;

(2) adding an amino-aldehyde pre-condensate to the emulsion to form a mixture; and

(3) heating the mixture to form microcapsules.

5,068,068

METHOD AND APPARATUS FOR EXTRUSION

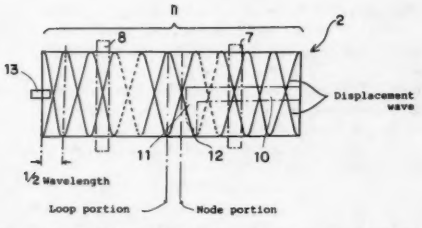
Toshihiro Furusawa; Atsushi Satoh, both of Chiba; Takashi Nakajima, and Noriaki Matsugishi, both of Tokyo, all of Japan, assignors to Idemitsu Kosan Co., Ltd. and Seidensha Electronics Co., Ltd., both of Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,509

Claims priority, application Japan, Nov. 24, 1988, 63-294624

Int. Cl.[5] B06B *3/00*; B29C *47/12, 47/92*

U.S. Cl. 264—23 3 Claims



1. An improved method of carrying out an extrusion in which an extrusion material in a flowable state is passed through a die under a pressure to impart a desired shape thereto, the improvement comprising a step of resonating the die by an ultrasonic wave at a resonance frequency of 10 kHz to 100 kHz so that the ultrasonic wave has n wavelengths, wherein n is m/2 and m is a positive integer.

5,068,069

METHOD OF MAINTAINING THE FORCE OF A STRIPPER BLADE ON AN EXTRUDER FEED ROLLER CONSTANT AND AN APPARATUS THEREFOR

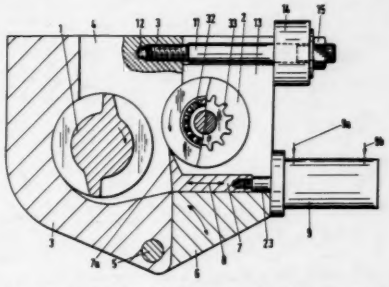
Gerd Capelle, Langenbagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 18, 1990, Ser. No. 599,513

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 3934734

Int. Cl.[5] B29C *47/92*

U.S. Cl. 264—40.5 10 Claims



1. A method of maintaining constant the force applied by a stripper blade against an adjacently disposed feed roller of an extrusion device comprising a barrel and an extrusion screw mounted for rotation within said barrel, said barrel defining a feed section into which material to be extruded is fed, and said feed section comprising receiver means pivotally connected to said barrel and communicating therewith; a feed roller mounted for rotation within said receiver means, a stripper blade directed towards but spaced from said feed roller for removing said material from said feed roller and for directing said material into said barrel for extrusion by said screw, said feed roller cooperating with said extruder screw, and means for measuring the pressure exerted in said barrel by said feed material, said method comprising the steps of:

a) measuring the force generated by said fed material tending to force said screw away from said feed roller means, and

b) applying a force to said stripper blade responsive to and in dependence upon said measured force such that the net force directing said stripper blade towards said feed roller means remains constant.

4. An extrusion device comprising:

a) a housing defining a feed section into which material to be extruded is fed;

b) screw means mounted for rotation within said housing;

c) receiver means in said feed section pivotally connected to said housing and communicating therewith;

d) a feed roller mounted for rotation within said receiver means and cooperating with said screw means;

e) a stripper blade directed towards said feed roller but spaced therefrom for removing said material from said feed roller and for directing said material into said housing;

f) means for measuring the force exerted by said fed material within said housing, said force measuring means comprising at least one tension rod connecting said receiver means to said housing; and at least one pressure gauge mounted on said at least one tension rod for measuring the force between said screw means and said feed roller;

g) control means connected to said at least one pressure gauge, and

h) means connected to and controlled by said control means for applying a force to said stripper blade, the force applied to said stripper blade though said control means being dependent upon said measured force so that the net

force directing said stripper blade towards said feed roller remains constant.

5,068,070

PROCESS FOR MAKING FILM

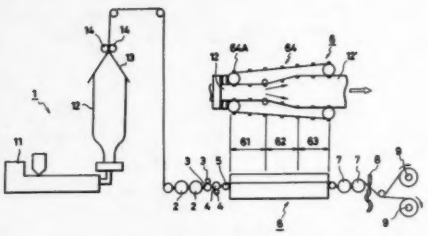
Akihiko Gunji; Tetsuya Masuki, both of Ichigai, and Hidenori Shirai, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 2, 1989, Ser. No. 415,661

Claims priority, application Japan, Oct. 12, 1988, 63-256455

Int. Cl.[5] B29C *55/20*

U.S. Cl. 264—41 **5 Claims**



1. A process for making a crack resistant film having a uniform thickness, improved flexibility and balanced strengths comprising the steps of:

forming a film of non-uniform thickness having an annularly shaped configuration from a composite material of a thermoplastic resin composition according to an inflation process such that said annular film has at least two thick portions opposite from each other within said annular shaped film, said thick portions being distinguishable from a remaining thin portion of said annular shaped film;

converting said non-uniform thick annular film into a flat shaped configuration by folding or collapsing said annular film such that said at least two thick portions are located substantially at opposite ends of said flat shaped configuration of said film;

clamping said flat-shaped film by said thick portions by a clamping portion of a stretching apparatus;

stretching said clamped flat-shaped non-uniform thick film so as to produce a uniformly thick film of said thin portion; and

removing said thick portions to produce said uniform thick film from said non-uniform thick film.

5,068,071

HOLLOW SPHERICAL SHELL MANUFACTURE

Thomas P. O'Holleran, Belleville, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Apr. 25, 1990, Ser. No. 514,233

Int. Cl.[5] B29C *67/00*

U.S. Cl. 264—56 **11 Claims**

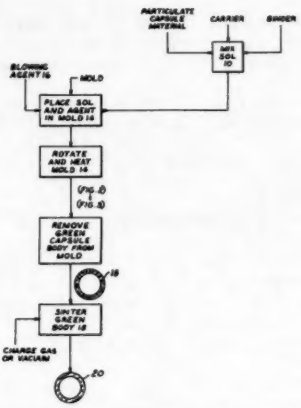
1. A process for making a hollow spherical shell of substantially uniform composition and geometry comprising the steps of:

(a) providing a mold having a hollow spherical cavity surrounded by a porous mold body,

(b) placing within said mold cavity a colloidal suspension of particles of selected material composition in a carrier liquid, said particles being of size greater than pore size of said mold body,

(c) placing a quantity of a volatile liquid that is immiscible in said carrier liquid in said cavity with said suspension,

(d) drawing said carrier liquid out of said cavity by capillary flow of said liquid into said mold body, and thereby depositing a green shell compact of said particles around said cavity, while heating said mold cavity so as to boil said volatile liquid such that vapor pressure of said boiled liquid assists migration of said carrier liquid into said mold body, and



(e) removing said green shell compact from said mold cavity.

5,068,072

ELECTRICALLY CONDUCTIVE ZIRCONIA-BASED SINTERED BODY AND PROCESS FOR THE PRODUCTION THEREOF

Kazuo Horinouchi, Niihama; Masahide Mouri, and Isao Kameda, both of Tsukuba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 11, 1989, Ser. No. 448,284

Claims priority, application Japan, Dec. 13, 1988, 63-315752; Nov. 13, 1989, 1-295242

Int. Cl.[5] C04B *35/48*

U.S. Cl. 264—66 **3 Claims**

1. A process for the production of an electrically conductive zirconia-based sintered body, which consists essentially of mixing a ZrO_2 powder, a TiN powder and a TiO_2 powder or mixing a TiO_2-containing ZrO_2 powder and a TiN powder such that the amount of TiN is 50 to 10 vol. %, that of TiO_2+-ZrO_2 is 50 to 90 vol. %, and that of Ti of TiO_2 is in the range of $0.3 < Ti \leqq 10$ in percentage by weight, shaping the mixture, then sintering the shaped body in an inert atmosphere from 1350° to 1650° C., and subjecting the resultant shaped body to heat treatment at a temperature from 1000° to 1300° C.

5,068,073

METHOD OF MANUFACTURING POLYETHYLENE FIBERS BY HIGH SPEED SPINNING OF ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE

Albert J. Pennings, Norg, and Mees Roukema, Groningen, both of Netherlands, assignors to Akzo N.V., Netherlands

Filed Jul. 13, 1990, Ser. No. 552,135

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923139

Int. Cl.[5] D01F *6/04*

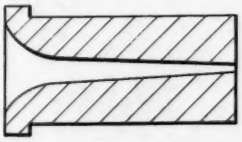
U.S. Cl. 264—205 **12 Claims**

1. A process for manufacturing polyethylene fibers by high-speed spinning of a solution of ultra-high-molecular-weight polyethylene, comprising the steps of:

extruding into a heating zone of a spinning duct a 1 to 6 wt. % solution of polyethylene with a molecular weight $M_w \geqq 1 \times 10^6$ and a solvent at an extrusion temperature $T_E = 180°-250°$ C. and at an extrusion rate $V_E = 5-150$ m/min through spinnerets with jet openings, the cross

section of the spinnerets decreasing towards the jet openings;

maintaining the heating zone of said spinning duct at a temperature of 100° to 250° C.;



blowing a gas on the extruded fibers below the heating zone;

pulling the fibers off at a speed $V_w \geqq 500$ min;

wherein the fibers are freed from substantially all of the solvent without further stretching.

5,068,074

METHOD FOR MAKING SYNTHETIC MEMBRANES FOR A GAS METER

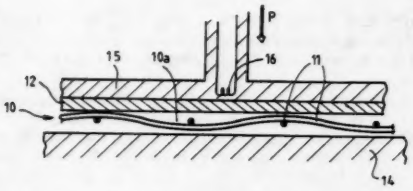
André De Régo, Antony, France, assignor to Schlumberger Industries, S.A., Montrouge, France

Division of Ser. No. 828,414, Feb. 11, 1986, Pat. No. 4,779,459. This application Oct. 20, 1988, Ser. No. 260,419

Claims priority, application France, Feb. 12, 1985, 85 01931

Int. Cl.[5] B29C *43/18*

U.S. Cl. 264—257 **10 Claims**



1. A method of making a gas meter membrane, comprising the following steps:

a film of non-vulcanizable thermoplastic elastomer material is disposed opposite to one face of a synthetic fiber structure of substantially constant thickness;

said elastomer material is raised to its softening temperature;

simultaneously, pressure is exerted on the assembly constituted by said structure and said film in order to cause said elastomer material to adhere to said structure, and to completely cover said face of the structure by deformation of said film;

said pressure is then removed and the resulting complex is allowed to cool; and

said complex is shaped in order to obtain a membrane of the desired shape.

5,068,075

METHOD OF BLOW MOLDING ASEPTIC BOTTLES

Dennis L. Dundas, Dover, and Eugene L. Moore, York, both of Pa., assignors to Graham Engineering Corporation, York, Pa.

Division of Ser. No. 382,546, Jul. 18, 1989. This application Sep. 26, 1990, Ser. No. 588,356

Int. Cl.[5] B29C *49/62, 49/64*

U.S. Cl. 264—505 **11 Claims**

1. The method of blow molding a hollow sealed bottle from a prison formed of a plastic material, the material having a set temperature, including the steps of:

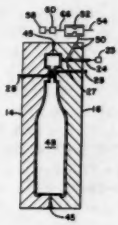
a. locating a parison having a temperature above the set temperature between a pair of open mold halves;

b. closing the mold halves to capture the parison in a mold cavity having the shape of a bottle;

c. increasing the pressure exerted by gas in the interior of the captured parison to above atmospheric pressure to expand the parison against the mold cavity and form an expanded body conforming in shape to the shape of the mold cavity and the expanded body having a hollow interior;

d. holding the expanded body against the mold cavity while cooling the exterior of the expanded body to form a skin on the body which is at a temperature below the set temperature;

e. reducing the pressure exerted by gas in the interior of the body to a subatmospheric pressure;



f. then sealing closed the body with the gas confined in the interior of the body at the subatmospheric pressure;

g. opening the mold halves and ejecting the molded and sealed body;

h. maintaining a first portion of the body at a temperature above the set temperature during steps d, e, f, and g; and

i. lastly, cooling the body to ambient temperature thereby releasing residual heat which warms the gas sealed in the body thereby increasing the pressure exerted by the gas in the interior of the sealed body to approximately atmospheric pressure without ballooning to form a stable sealed bottle conforming to the shape of the mold cavity.

5,068,076

METHOD OF FORMING AN ENCAPSULATED GLAZING UNIT

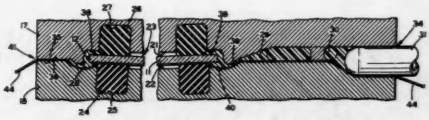
William R. Weaver, and James E. Matzinger, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Jul. 28, 1988, Ser. No. 225,729

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[5] B29C *45/14*

U.S. Cl. 264—511 **7 Claims**



1. A method of forming an encapsulated glazing unit including a polymeric gasket formed in situ around at least a portion of the periphery of a transparent sheet and a protective coating material chemically bonded to a surface of the gasket, comprising providing a mold including a cavity for forming the gasket on said transparent sheet and which defines the surface of the gasket to which the coating material is to be chemically bonded, disposing a sheet of the coating material across the mold and cavity by withdrawing said sheet of coating material across said mold from a continuous supply at one side of said mold and winding the used sheet of coating material upon a reel at the opposite side following each molding cycle to dispose the sheet of coating material across said mold and cavity, said sheet of coating material being disposed wrinkle-free

across said cavity placing the transparent sheet in the mold with one of its major surfaces on said sheet of coating material, injecting a flowable polymeric gasket forming material into said cavity behind said sheet of coating material to fill said cavity and deform said sheet of coating material to conform to the cavity defining said surface of the gasket and polymerizing and curing said gasket forming material in situ to form said gasket on said transparent sheet and simultaneously chemically bond said coating material to the surface of said gasket opening said mold and removing said glazing unit from said sheet of coating material by severing said coating material around the outside of said gasket, and then severing said coating material around the inside of said gasket and removing said coating material covering said transparent sheet.

5,068,077

PROCESS OF VACUUM-AIR PRESSURE DRAWING OF A LAMINATE CONTAINING AN EVOH/POLYAMIDE COPOLYMER

Taichi Negi; Satoshi Hirofuji, both of Kurashiki; Nobuo Tanaka, Nishinomiya, and Syuji Kawai, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 239,056, Sep. 1, 1988, abandoned, which is a continuation of Ser. No. 30,039, Mar. 24, 1987, abandoned. This application Dec. 18, 1990, Ser. No. 630,386
Claims priority, application Japan, Mar. 26, 1986, 61-69586
Int. Cl.[5] B29C *51/10, 51/14*
U.S. Cl. 264—512 **8 Claims**

1. A method of preparing a container comprising the step of forming said container by vacuum air-pressure at a drawing speed of at least 5×10^5%/min from a multilayered laminate comprising a layer of an ethylene-vinyl alcohol copolymer composition comprising 70 to 95 wt% of an ethylene-vinyl alcohol copolymer having an ethylene content of 25 to 60 mol% and a saponification degree of at least 90%; 5 to 30 wt% of an aliphatic copolymer polyamide containing capramide as a main structural unit, said copolymer polyamide having a ratio of the number of methylene to the number of amide groups satisfying the condition:

$$7.0 \leqq CH_2/NHCO \leqq 10.0$$

having a melting point of 110° to 180° C. and exhibiting a melt index of 0.1 to 10 g/10 mins.; and having a thermoplastic resin layer on at least one surface of said layer, said thermoplastic resin layer drawable in a hot drawing temperature range satisfying the equation:

$$X - 10° C. \geqq Y \geqq X - 110° C.$$

wherein X represents the melting pint (°C.) of EVOH and Y represents the hot drawing temperature.

5,068,078

PARISON LUBRICATION METHOD

Gary Hill, Kansas City, Mo.; Walter K. Schoch, Peachtree City, Ga., and Michael Warkentien, Independence, Mo., assignors to Sewell Plastics, Inc., Atlanta, Ga.

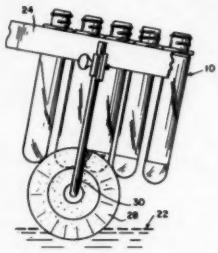
Division of Ser. No. 284,171, Dec. 14, 1988, abandoned. This application Jun. 11, 1990, Ser. No. 535,702
Int. Cl.[5] B29C *49/00, 49/20*
U.S. Cl. 264—512 **8 Claims**

1. A method for enhancing the uniformity of wall thickness of an article having a high aspect ratio horizontal cross section of greater than about 1.7 and produced from a parison having a closed bottom in a blow molding process comprising the steps of:

providing a blow molding apparatus which forms a finished article having a high aspect ratio horizontal cross section of greater than about 1.7;

providing a supply of parisons of a given vertical extent for forming articles in a blow molding apparatus;

applying a barrier layer to the closed bottom and a selected vertical extent of the outer surface of each parison which is substantially less than the entire given vertical extent of each parison, prior to its introduction into the blow molding apparatus; and



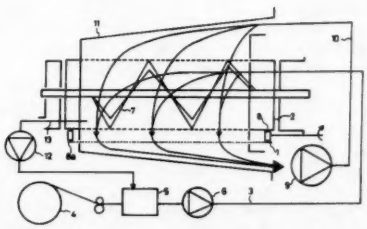
inserting the parison having the barrier layer in the blow molding apparatus and blow molding, the barrier layer being effective to prevent premature freezing of the blown parison upon contact with a wall of the blow molding apparatus during blow molding.

5,068,079

METHOD FOR FORMING A DRY WEB ON THE WIRE

Helmer Gustafsson, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Oy Walkisoft Engineering, Valkeakoski, Finland

Continuation of Ser. No. 209,376, Jun. 21, 1988, abandoned. This application Sep. 26, 1990, Ser. No. 590,459
Claims priority, application Finland, May 20, 1988, 882401
Int. Cl.[5] B27N *3/04*
U.S. Cl. 264—518 **5 Claims**



1. In a process for forming a dry web on a wire, where wood fibers are fed to at least one perforated drumlike forming element from a defibrator stage of said process, which forming element covers essentially the whole width of the web to be formed, and in which said wood fibres are conveyed along the width of the web and screened through a mantle of said drumlike forming element onto said wire, wherein the improvement comprises the steps of;

feeding said wood fibers into the drumlike forming element;

screening the bulk of said fibres onto said wire as said fibres advance in the feeding direction towards the other end of said drumlike forming element;

removing the fiber bundles or lumps which do not get screened from said forming element; and

returning said unscreened fiber bundles or lumps to an earlier process stage for defibration.

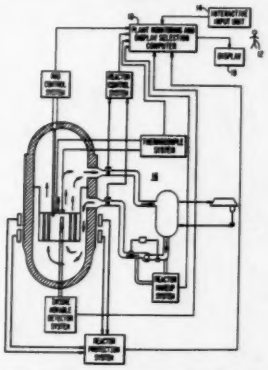
5,068,080

OPERATION STATE RESPONSIVE AUTOMATIC DISPLAY SELECTION SYSTEM

Albert J. Impink, Jr., Murrysville, and Melvin H. Lipner, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1989, Ser. No. 307,831
Int. Cl.[5] G21C 7/36
U.S. Cl. 376—215 9 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 19 Pages)



1. A method of monitoring preplanned state changes carried out in accordance with a procedure including a preplanned sequence of operations performed by an operator, comprising the steps of:

(a) monitoring actual size changes;

(b) comparing the actual state changes with the preplanned state changes of the operations; and

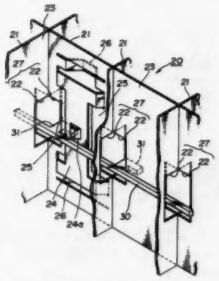
(c) alerting the operator only when the actual state changes indicate a deviation from the preplanned operations of the procedure.

5,068,081

METHOD OF INSERTING FUEL RODS INTO A NUCLEAR FUEL ASSEMBLY GRID

Junichi Oyama; Kazuichi Suzuki; Akihiro Kato, all of Ibaraki; Hitoshi Inada, Kobe; Masaji Mori, Kobe; Hiromasa Miyai, Kobe, and Toshiyuki Kawagoe, Minato, all of Japan, assignors to Mitsubishi Nuclear Fuel Co., Tokyo, Japan

Filed Jan. 3, 1990, Ser. No. 460,626
Claims priority, application Japan, Jan. 6, 1989, 1-957
Int. Cl.[5] G21C 21/00
U.S. Cl. 376—261 6 Claims



1. A method of assembling a nuclear fuel assembly, comprising the steps of:

preparing a plurality of grids each of which comprises a plurality of elongated straps intersected with each other to define a plurality of grid cells therein, and a plurality of pairs of dimples and springs formed on said straps for supporting a plurality of fuel rods, each pair of dimple and spring being disposed in facing relation to each other, on wall sections of the straps, which cooperate with each other to define one of the grid cells, the pair of dimples and spring projecting into the grid cell;

subsequently inserting a deflecting jig into one of the grid cells defined in each of said grids, said deflecting jig being in the form of a rod having a diameter capable of being enlarged;

subsequently enlarging the diameter of said deflecting jig to urge the spring associated therewith against resilient force of the spring to deflect the spring away from the dimple associated therewith;

subsequently inserting a plurality of elongated key members, respectively along a longitudinal direction of the straps forming the grid, into the grid cells through a plurality of openings which are defined at intersections between the straps, each of said key members being formed with a plurality of hooks which are spaced a predetermined spacing from each other along the longitudinal direction of the key member;

subsequently rotating each of said key members about its axis to cause the hooks of the key member to project from a wall surface of the strap associated with the key member, through the openings, in a direction opposite to the projecting direction of the springs formed on the strap;

subsequently moving the key member forwardly in the longitudinal direction of the strap to engage the hooks of the key member with the wall surface of the strap, thereby fixedly mounting the key member to the strap to maintain the springs deflected;

subsequently releasing the urging of the spring due to said deflecting jig to withdraw the same from the grid cell and, subsequently, inserting said fuel rods respectively into the grid cells;

subsequently moving the key member rearwardly to release retention of the springs due to the hooks of the key member thereby bringing the springs into pressure contact with the fuel rods, respectively; and

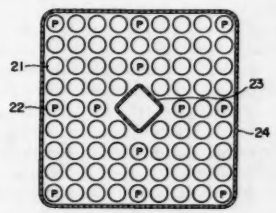
withdrawing said key members from the grid cells.

5,068,082

FUEL ASSEMBLY FOR NUCLEAR REACTOR

Makoto Ueda, Yokohama; Koichi Sakurada, Narashino; Shungo Sakurai, Yokohama; Ritsuo Yoshioka, Yokohama; Shunsuke Ogiya, Yokohama, and Mamoru Nagano, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 15, 1988, Ser. No. 219,346
Claims priority, application Japan, Jul. 18, 1987, 62-178190; Jul. 20, 1987, 62-179213; Sep. 30, 1987, 62-244082; Oct. 12, 1987, 62-254593; Nov. 7, 1987, 62-280312; Nov. 26, 1987, 62-296058
Int. Cl.[5] G21C 3/30
U.S. Cl. 376—428 59 Claims



1. A fuel assembly for a nuclear reactor of the type in which

a number of fuel rods, each constructed by filling a clad with a fuel material, are arranged in a bundle, comprising:

a plurality of first fuel rods having a partial effective fuel area filled with a fuel material and having a portion in which enrichment of a fissile nuclide in the clad of the fuel rod is significantly reduced, or the fissile nuclide does not exist at all, positioned on an axial level including a portion at which subcriticality becomes small at a period in which maintenance of reactor shut-down margin is small during a reactor operation period; and

a plurality of second fuel rods having a total effective fuel area filled with a fuel material throughout an entire axial length of the clad of the fuel rod, wherein said first fuel rods are disposed in straight lines inside the bundle so as to horizontally separate said second fuel rods into a plurality of sub-bundles.

5,068,083

DASHPOT CONSTRUCTION FOR A NUCLEAR REACTOR ROD GUIDE THIMBLE

Clarence D. John, Jr., Penn Hills, Pa., and James A. Sparrow, Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1990, Ser. No. 529,845
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—449 **19 Claims**

1. In a control rod guide thimble having a main hollow tube defining a substantial portion of the length of said guide thimble, a dashpot comprising:

(a) a lower tubular portion of said main hollow tube; and

(b) an auxiliary hollow tube having concentric exterior and interior surfaces, said auxiliary tube being inserted in said lower portion of said main hollow tube and having an outside diameter slightly less than an inside diameter of said main tube to permit a close fitting relationship between said exterior surface of said auxiliary tube and an interior surface of said main tube lower portion, said auxiliary tube having an upper end portion with an inside surface portion in axial cross-section flaring in inclined relation upwardly and outwardly to provide a tapered transition extending between and connecting said interior surface of the auxiliary tube with said exterior surface thereof; and

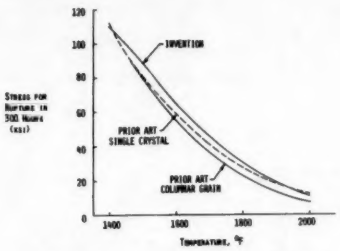
(c) an end plug attached to a lower end of said auxiliary tube.

5,068,084

COLUMNAR GRAIN SUPERALLOY ARTICLES

Alan D. Cetel, West Hartford, and David N. Duhl, Newington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 2, 1986, Ser. No. 815,608
Int. Cl.[5] C22C *19/05*
U.S. Cl. 420—443 **8 Claims**



1. A superalloy composition suited for the fabrication of columnar grain articles which consists essentially of:

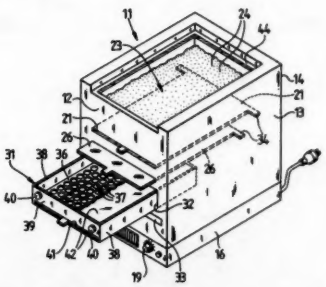
3–10% Cr
2.1–16.0% Co
1.0–1.9% Mo
3–10% W
0–5% Re
4–7% Al
0–1.5% Ti
0–8% Ta
0.5–3.0% Hf
0–2% Cb
0–1% V
0.02–0.12% Zr
0.03–0.20% C
0.005–0.25% B
0–10% reactive element
Balance Ni.

5,068,085

INSTRUMENT STERILIZER

Joseph A. Hastings, 2124 Dorchester Dr., Mobile, Ala. 36695

Filed Oct. 17, 1988, Ser. No. 258,888
Int. Cl.[5] F28C *3/10*
U.S. Cl. 422—1 **17 Claims**



1. Apparatus for sterilizing dental instruments and the like comprising:

(a) a container having an internal cavity and a set of upstanding walls having at least an inner portion of heat transferring material;

(b) means for providing heat to said walls in a controllable manner;

(c) a plurality of heat transfer beads;

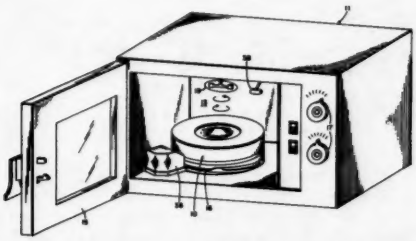
(d) an instrument tray including means for selectively retaining or releasing said beads within said tray, said tray adapted for cooperative insertion into said container through an opening in one wall of said container;
(e) means for retaining a quantity of beads within said container above an instrument tray inserted in said opening; and
(f) means for releasing a predetermined quantity of beads into said instrument tray from said means for retaining.

5,068,086

METHOD AND APPARATUS FOR BATCH FIXATING TISSUE SPECIMENS

John S. Sklenak, Sudbury; Robert F. Bowen, Burlington, and Kenneth W. Dudley, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 12, 1990, Ser. No. 536,848
Int. Cl.[5] A61L *2/00*; A01N *1/00*; H05B *6/64*
U.S. Cl. 422—21 13 Claims



1. Apparatus adapted for chemically fixating in a multimode microwave oven cavity a plurality of tissue specimens in a batch operation, said apparatus comprising:
a tray having a circular bottom and an outer wall, said tray containing a fixating solution;
a plurality of cassettes submerged in said solution in said tray, each of said cassettes containing a respective tissue specimen, each of said cassettes having an elongated side radially aligned in said tray;
means for rotating said tray within said microwave oven cavity; and
means for selectively shielding said tray from microwave energy in said cavity to provide a substantially uniform microwave field within said tray thereby providing substantially uniform fixating results of said specimens after a predetermined interval of activation of said microwave oven.

5,068,087

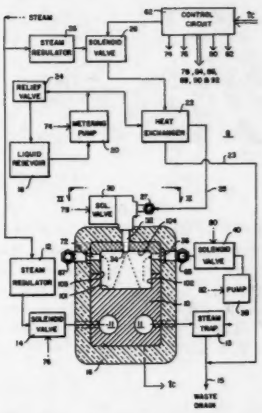
HIGH CAPACITY MULTICOMPONENT LIQUID VAPORIZER

Robert W. Childers, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 30, 1988, Ser. No. 292,271
Int. Cl.[5] A61L *2/20*; F22B *3/00*
U.S. Cl. 422—26 16 Claims

1. An apparatus for vaporizing a multicomponent liquid, comprising:
a vaporization chamber having a plurality of surfaces, a first inlet and a second inlet for passage of the liquid into said chamber, and an outlet for passage of vapor from said chamber;
means for heating said surfaces of said chamber to a temperature sufficient to vaporize the liquid;
means for injecting the liquid in metered increments into said chamber with sufficient velocity to ensure multiple impingements with said surfaces such that the liquid is substantially completely vaporized after said multiple impingements, said means for injecting comprising a first solenoid valve for supplying said metered increments to a first nozzle positioned in said first inlet and a second solenoid valve for supplying said metered increment to a second nozzle positioned in said second inlet and wherein said means for injecting includes a control circuit for sequentially opening and closing said first and said second valves such that said apparatus is capable of vaporizing a substantially steady stream of the liquid.

10. A method of vaporizing a multicomponent liquid, comprising the steps of:



heating the interior surfaces of a vaporization chamber to a temperature sufficient to vaporize the liquid, said chamber having at least two inlets for inputting the liquid into said chamber and an outlet for outputting of vapor from said chamber;
injecting the liquid into said chamber through said inlets in alternating fashion between different areas of said chambers with sufficient velocity to ensure multiple impingements with said different areas of said surfaces such that the liquid is substantially completely vaporized after said multiple impingements; and
outputting the vapor from said chamber through said outlet.

5,068,088

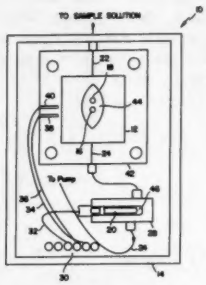
METHOD AND APPARATUS FOR CONDUCTING ELECTROCHEMILUMINESCENT MEASUREMENTS

Lee O. Hall, Gaithersburg; Glenn Zoski, Rockville, and Surendera K. Tyagi, Gaithersburg, all of Md., assignors to Igen, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 267,234, Nov. 3, 1988. This application Mar. 17, 1989, Ser. No. 325,459
Int. Cl.[5] G01N *21/76*; H01J *1/62*; H03K *4/00*
U.S. Cl. 422—52 14 Claims

7. A method for measuring electrochemiluminescent phenomena of a sample, said method comprising the steps of:
(a) introducing said sample into a cell having a working electrode located within said cell so as to be exposable to said sample;
(b) applying a controlled voltage waveform to said working electrode to trigger electrochemiluminescence in said sample;
(c) generating said controlled voltage waveform substan-

tially as a function of the current induced in said sample during the triggering of electrochemiluminescence; and



(d) detecting electrochemiluminescent radiation from said sample.

5,068,089

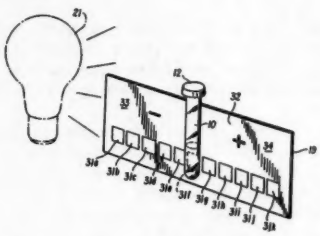
KIT FOR TESTING HUMAN MALES FOR FERTILITY

Ronald J. Ericsson, and Scott A. Ericsson, both of Alzada, Mont., assignors to Androscore Corporation, Alzada, Mont.

Division of Ser. No. 404,467, Sep. 8, 1989, which is a continuation-in-part of Ser. No. 242,104, Sep. 9, 1988, abandoned. This application Feb. 25, 1991, Ser. No. 660,081

Int. Cl.[5] G01N *33/50, 21/78*

U.S. Cl. 422—61 **8 Claims**



1. A test kit for determining the potential fertility of a semen sample of a human male, the test kit comprising:

a container with collection means for receiving the semen sample, comprising a gradation thereon for determining the volume of the semen sample;

a reagent dye which is capable of being reduced in the presence of metabolizing sperm from one colored state to another colored state;

a dispensing device for dispensing a measured amount of the reagent dye;

means for maintaining a mixture of the dye and semen sample at an elevated temperature; and

a color chart comprising a plurality of color samples corresponding to the color change affected in corresponding mixtures of the dye and sperm samples of known varying number of motile sperm cells per ml, including an infertile sperm sample.

5,068,090

AQUEOUS CARBON DIOXIDE MONITOR

Dennis J. Connolly, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 26, 1990, Ser. No. 499,142

Int. Cl.[5] G01N *27/06*

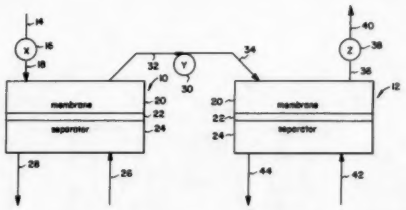
U.S. Cl. 422—82.02 **4 Claims**

1. An apparatus for measuring low levels of carbon dioxide in a water sample, comprising:

means for exchanging cations for hydrogen connected to a sample stream;

a first membrane separator connected to said cation exchanging means, said first membrane separator having a first and second compartment with said first and second compartments being separated by a membrane, said first compartment constructed so as to receive said sample stream, said second compartment constructed so as to supply a weak base to neutralize strong acids contained in said sample stream, and to leave carbonic acid in said sample stream unreacted, said membrane constructed so as to separate said weak base from said sample stream and to allow for an exchange of ions;

first means for measuring conductivity connected to said first compartment of said first membrane separator, said first conductivity measuring means receiving the sample stream therefrom and measuring the conductivity thereof;



a second membrane separator connected to said first conductivity measuring means for receiving the sample stream, said second membrane separator having a first and second compartment separated by a membrane, said first compartment constructed so as to receive said sample stream from said first conductivity measuring means, said second compartment constructed so as to supply a strong base to convert the carbonic acid in said sample stream to a carbonate salt, said membrane constructed so as to separate said strong base from said sample stream and to allow for an exchange of ions;

second means for measuring conductivity connected to said first compartment of said second membrane separator for receiving the reacted sample stream and measuring the conductivity thereof; and

means for determining carbon dioxide concentration in communication with said first and second conductivity measuring means for calculating carbon dioxide concentration from changes in conductivity.

5,068,091

DEVICE FOR DYEING TISSUES FOR IMMUNE RESPONSE OBSERVATION

Matsumi Toya, Koushoku, Japan, assignor to Kabushiki Kaisha Tiyoda Seisakusho, Koushoku and Sakura Finetechnical Co., Ltd., Tokyo, both of, Japan

Filed Feb. 22, 1989, Ser. No. 314,374

Claims priority, application Japan, Feb. 22, 1988, 63-21239

Int. Cl.[5] B01L *3/00*

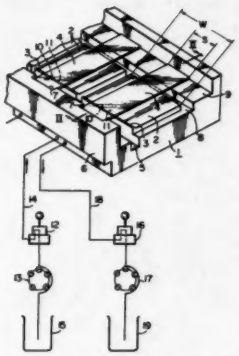
U.S. Cl. 422—99 **12 Claims**

1. A device for dyeing tissues for immune response observation comprising:

flat base means with a substantially horizontal upper surface having first and second sides;

means for supporting on said upper surface a slide glass having an undersurface for facing said upper surface, the undersurface having a tissue attached thereto, said means for supporting the slide glass comprising a ridge-shaped protrusion constructed so as to extend along said first side and a supporting surface constructed so as to extend along the second side, said protrusion and said supporting surface constructed so as to support thereon two end portions of the slide glass, respectively, said protrusion and said

supporting surface being disposed and sized such that the protrusion is higher than said upper surface of the flat base means and the supporting surface is higher than said protrusion so as to define thin wedge-shaped capillary gap between said upper surface and said undersurface increasing in width from said first side to said second side; and



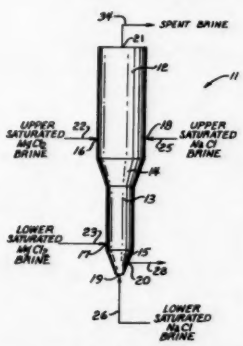
means for supplying a dyeing liquid into said gap so as to cause the dyeing liquid to spread into the gap by capillary action thereby bringing the liquid into intimate contact with the tissue on the slide glass.

5,068,092

CRYSTALLIZER, PROCESS AND APPARATUS FOR PRODUCING SODIUM CHLORIDE CRYSTALS

Martin N. Aschauer, Port Huron, Mich., assignor to Akzo N.V., Netherlands

Filed May 21, 1990, Ser. No. 526,209
Int. Cl.[5] C01D 3/06
U.S. Cl. 422—253 **5 Claims**



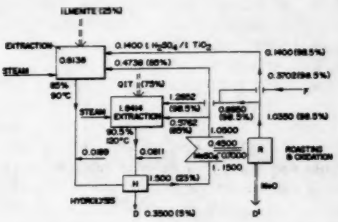
1. A flow-through sodium chloride crystallizer comprised of a vertically oriented crystallizer body having at least two segments of different cross-sectional area, at least two inlets for the introduction of saturated $MgCl_2$ brine at a minimum of two distinct vertical locations having different cross-sectional areas along the crystallizer body, at least two inlets for the introduction of a saturated NaCl brine at a minimum of two distinct vertical locations having different cross-sectional areas along the crystallizer body, at least one lower outlet for removal of NaCl crystals and at least one upper outlet for removal of spent brine.

5,068,093

METHOD FOR PRODUCING TITANIUM DIOXIDE

Josef Mauer, Leverkusen, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss AG, Zurich, Switzerland

Filed Nov. 17, 1988, Ser. No. 273,439
Claims priority, application Switzerland, Nov. 23, 1987, 04548/87
Int. Cl.[5] C01G 23/04
U.S. Cl. 423—82 **8 Claims**



1. A method of producing titanium dioxide, comprising the steps of:

(1) selecting titanium slag and ilmenite as titanium-containing starting materials in a defined ratio;

(2) during a parallel treatment, reacting said titanium slag with sulphuric acid and separately reacting said ilmenite with sulphuric acid;

(3) said step of reacting said titanium slag during said parallel treatment with the sulphuric acid entailing the steps of:

(i) mixing said titanium slag with highly concentrated sulphuric acid having a concentration of at least 95% by weight;

(ii) adding to the thus obtained mixture, less concentrated sulphuric acid having a concentration in a range of 76% by weight to 87% by weight;

(iii) reacting said mixture containing said added less concentrated sulphuric acid and thereby obtaining a titanium-containing solution;

(iv) separating said titanium-containing solution from a titanium slag treatment residue;

(4) said step of reacting said ilmenite with sulphuric acid during said parallel treatment entailing the steps of:

(i) mixing said ilmenite with highly concentrated sulphuric acid having a concentration of at least 95% by weight;

(ii) adding to the thus obtained mixture, less concentrated sulphuric acid having a concentration in a range of 76% by weight to 98% by weight;

(iii) reacting said mixture containing said added less concentrated sulphuric acid and thereby obtaining a titanium-containing solution;

(iv) separating said titanium-containing solution from an ilmenite treatment residue;

(5) combining the titanium-containing solutions separated from said titanium slag treatment residue and said ilmenite treatment residue;

(6) hydrolysing the thus obtained combined titanium-containing solutions and thereby obtaining a titanium-containing hydrolysis product and a other liquor constituting a metal sulphate containing dilute sulphuric acid;

(7) separating said titanium-containing hydrolysis product from said mother liquor;

(8) recovering titanium dioxide from said titanium-containing hydrolysis product;

(9) concentrating said mother liquor and thereby recovering sulphuric acid having a concentration in the range of 76% by weight to 87% by weight;

(10) during said step of concentrating said mother liquor, separating metal sulphates from said mother liquor;

(11) recycling said recovered sulphuric acid having said

concentration in the range of 76% by weight to 87% by weight into said parallel treatment and

(i) utilizing part of said recovered sulphuric acid during said step of adding said sulphuric acid having said concentration in the range of 76% by weight to 87% by weight to said mixture of titanium slag and highly concentrated sulphuric acid having a concentration of at least 95% by weight;

(ii) utilizing a further part of said recovered sulphuric acid during said step of adding said sulphuric acid having said concentration in the range of 76% by weight to 87% by weight to said mixture of ilmenite and highly concentrated sulphuric acid having a concentration of at least 95% by weight;

(12) during said parallel treatment, utilizing as a starting condition for reacting said titanium slag (i) a temperature of about 120° C. and (ii) a ratio of said highly concentrated sulphuric acid having a concentration of at least 95% by weight and said recovered and recycled sulphuric acid having a concentration in the range of 76% by weight to 87% by weight which results in a total sulphuric acid concentration of about 90% by weight; and

(13) during said parallel treatment, utilizing as a starting condition for reacting said ilmenite (i) a temperature of about 90° C. and (ii) a ratio of said highly concentrated sulphuric acid having a concentration of at least 95% by weight and said recovered and recycled sulphuric acid having a concentration in the range of 76% by weight to 87% by weight which results in a total sulphuric acid concentration of about 85% by weight.

5,068,094

PROCESS FOR THE REMOVAL OF CADMIUM IONS FROM PHOSPHORIC ACID RESULTING FROM A WET PROCESS

Klaus Frankenfeld, Hünfelden; Klaus Beltz, Budenheim; Gerhard Eich, Ingelheim, and Klaus Endrich, Mainz-Finthen, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Budenheim Rudolf A. Oetker, Budenheim, Fed. Rep. of Germany

Filed May 25, 1990, Ser. No. 529,193

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917189

Int. Cl.[5] C01G *55/00*

U.S. Cl. 423—109 **62 Claims**

1. A process for the removal of cadmium ions from wet process phosphoric acid by liquid-liquid extraction, comprising

contacting the wet process phosphoric acid with at least one salt present in an organic solvent, where the organic solvent is immiscible with water, aqueous salt solutions, and aqueous acids, and wherein the salt is selected from salts of organic primary, secondary, and tertiary amines and quaternary ammonium salts; and

separating the organic solvent phase, containing the extracted cadmium ions, from the wet process phosphoric acid;

said amine and ammonium salts, respectively, being salts which, as anions, contain chlorocomplexes of one or several polyvalent metals different from cadmium.

5,068,095

METHOD FOR REDUCING THE AMOUNT OF COLORANTS IN A CAUSTIC LIQUOR

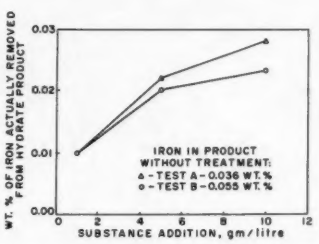
William A. Nigro, Benton, Ark., and Gary A. O'Neill, Tyngsborough, Mass., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 275,683, Nov. 23, 1988, Pat. No. 4,915,930, which is a continuation of Ser. No. 891,751, Jul. 31, 1986, abandoned. This application Apr. 10, 1990, Ser. No. 507,386

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] C01D *1/32*; C01F *7/04*

U.S. Cl. 423—122 **20 Claims**



1. A method for treating a caustic solution to remove a colorant therefrom, said method comprising:

contacting the solution with a substance comprising a calcined product of a compound having the formula $A_wB_x(OH)_yC_z{\cdot}nH_2O$, wherein: A represents a divalent metal cation; B a trivalent metal cation; C a mono- to tetravalent anion; and w, x, y, z and n satisfy the following: $0<z\leqq x\leqq 4\leqq w\leqq \frac{1}{2}y$ and $12\geqq n\geqq \frac{1}{2}(w-x)$.

5,068,096

SYNTHESIS OF CRYSTALLINE SILICATE MCM-47

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corp., Fairfax, Va.

Filed Apr. 8, 1991, Ser. No. 682,045

Int. Cl.[5] C01B *35/12*

U.S. Cl. 423—277 **17 Claims**

1. A method for synthesizing crystalline material exhibiting a characteristic X-ray diffraction pattern including d-spacing maxima values, in Angstroms, as follows:

10.9±0.15
6.91±0.08
6.23±0.08
5.18±0.05
4.90±0.05
4.35±0.05
4.17±0.03
3.86±0.03
3.81±0.03
3.78±0.03
3.67±0.03
3.57±0.03
3.48±0.03

which comprises (i) preparing a mixture capable of forming said material, said mixture comprising sources of alkali or alkaline earth metal (M), an oxide of trivalent element (X), an oxide of tetravalent element (Y), water and bis(methylpyrrolidinium)-DIQUAT-4 directing agent (R), and having a composition, in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	200 to ∞
H_2O/YO_2	5 to 400
OH^-/YO_2	0 to 1.0

-continued

M/YO_2	0 to 2.0
R/YO_2	0.005 to 2.0

(ii) maintaining said mixture under sufficient conditions until crystals of said material are formed; and (iii) recovering said crystalline material from step (ii), said recovered crystalline material containing said R.

5,068,097

HIGHLY PURE TANTALUM PENTOXIDE AND A PROCESS FOR ITS PREPARATION

Joachim Eckert, Bad Harzburg, and Walter Bludssus, Vienenburg, both of Fed. Rep. of Germany, assignors to Herman C. Starck Berlin GmbH & Co. KG, Berlin, Fed. Rep. of Germany

Filed Feb. 2, 1990, Ser. No. 473,731

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1989, 3904292

Int. Cl.[5] C01G *35/00*

U.S. Cl. 423—592 **7 Claims**

1. Tantalum pentoxide consisting essentially of particles with an average particle size less than 0.5 μm with a purity greater than 99.99% and having a flowability of less than 50 seconds with a flowmeter orifice of 5.08 mm.

5,068,098

PERFLUORO-CROWN ETHERS IN FLUORINE MAGNETIC RESONANCE SPECTROSCOPY

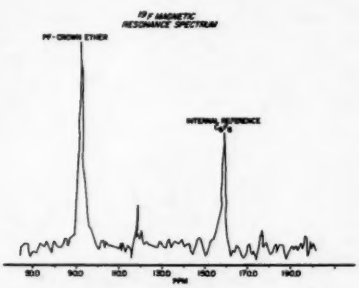
Frank K. Schweighardt, Allentown, and Joseph A. Rubertone, Coatesville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 11, 1990, Ser. No. 535,818

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] G01N *31/00, 24/00;* A61K *31/335*

U.S. Cl. 424—9 **4 Claims**



1. In a method for obtaining a ^{19}F-fluorine magnetic resonance spectrum from body cavities, organs or tissue by administering to a mammal a fluorine-containing agent in a diagnostically effective amount to provide a fluorine magnetic resonance spectrum from such cavities, organs or tissues, the improvement comprising using as said fluorine-containing agent an aqueous isotonic emulsion of perfluoro 15-crown-5 ether.

5,068,099

HAIR SPRAY PACKAGE WITH LOW VOLATILE ORGANIC COMPOUND EMISSION

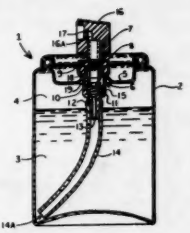
John A. Sramek, Wind Point, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jan. 16, 1990, Ser. No. 464,796

Int. Cl.[5] A61K *7/11, 9/12;* B65D *83/14;* B05B *1/00*

U.S. Cl. 424—47 **18 Claims**

1. An improved self-propelled aerosol hair spray package comprising, in combination, a pressurized aerosol container sealed with an aerosol valve containing an actuator button having an exit orifice in flow communication with said valve and an alcoholic hair spray composition sealed within the container, the improvement comprising the valve being a low delivery rate valve capable of discharging the hair spray composition through the exit orifice at a rate of 0.20 to 0.38 grams per second and the hair spray composition comprises from about 1% to about 10% by weight of the total composition of at least two compatible hair fixative polymers in a weight ratio of at least 99:1 to 1:99, wherein one polymer present differs in weight average molecular weight from at least one other by a factor of at least 1.5 and at least one polymer present has a weight average molecular weight of at least 100,000 wherein



the polymers and their total weight present in combination with the aerosol valve and actuator button on the package results in a discharged atomized aerosol spray having a volume means particle size in the range of from about 60±12 microns, the remainder of the composition comprising both a solvent selected from the group consisting of C_2–C_4 alcohols, water and mixtures thereof, there being no more than about 10% by weight water present based upon the total weight of the hair spray composition, and a propellant, wherein the package gives relatively the same number of uses, but has from about one-third to one-half of the volume of hair spray composition, as does a second package having (a) at least twice the discharge rate, (b) a volume mean average particle size in the same range, and (c) about one-half by weight of the hair fixative polymer content.

5,068,100

ANTICALCULUS COMPOSITIONS

Stephen F. McClanahan, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 321,249, Mar. 9, 1989, Pat. No. 4,990,328. This application Nov. 14, 1990, Ser. No. 613,332

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] A61K *7/16, 7/18, 7/24*

U.S. Cl. 424—52 **11 Claims**

1. An anticalculus composition comprising:

(a) a safe and effective amount of a phosphocitrate material; and

(b) an acceptable toothpaste carrier.

5,068,101

HAIR RELAXER CREAM

Muhammad Akhtar, Bolingbrook, and Florine Newell, Chicago, both of Ill., assignors to Johnson Products Co., Inc., Chicago, Ill.

Division of Ser. No. 399,385, Aug. 25, 1989, Pat. No. 4,950,485, which is a continuation of Ser. No. 173,318, Mar. 25, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 486,538

Int. Cl.[5] A61K *7/09*

U.S. Cl. 424—71 **7 Claims**

1. A method of preparing a highly alkaline oil-in-water emulsion cream which is stable to phase separation on storage aging, contains non-volatile inorganic alkaline material having

an alkali earth or alkaline earth cation and is directly usable as a no-base hair relaxer or is convertible to use as a no-base, no-lye hair relaxer when it is mixed with an aqueous activator solution, said emulsion having a pH above about 12, and a total of not more than about 50 weight percent non-water components, calculated as dry solids basis of the total weight of the composition, the method comprising the steps of:

(a) preparing an oil phase by heating and agitating a substantially anhydrous mixture comprising:

(i) about 15 to about 35 weight percent of a lipophilic oleaginous material;

(ii) zero to about 2 weight percent of a lipophilic modified hectorite clay gellant;

(iii) about 3 to about 15 weight percent of a primary nonionic emulsifier, said emulsifier comprising a mixture of lipophilic fatty alcohols having from about 12 to about 24 carbon atoms in their fatty carbon chain per molecule; and

(iv) about 0.01 to about 1 weight percent auxiliary anionic emulsifier, all weight percents being based on the total weight of the composition, dry solids basis, at about 80 degrees C until said mixture is substantially homogeneous;

(b) preparing a water phase by heating and agitating, in a separate container, an aqueous mixture comprising:

(i) water;

(ii) about 0.1 to about 10 weight percent of said alkaline material selected from the group consisting of water-soluble alkali metal hydroxide and alkaline earth hydroxide, wherein when the alkaline material is alkali metal hydroxide it is separately dissolved in a portion of the water and that portion is initially withheld;

(iii) about 0.05 to about 10 weight percent of auxiliary water-soluble emulsifying agents less the amount of the anionic emulsifier in the oil phase, said emulsifying agents comprising a hydrophilic nonionic emulsifier and an amphoteric or zwitterionic emulsifier;

(iv) about 0.1 to about 10 weight percent of a water-soluble polyhydroxy compound having about 3 to about 6 carbon atoms per molecule; and

(v) zero to about 5 weight percent of a polymeric quaternary nitrogen conditioning agent, all weight percents being based on the total weight of the composition, dry solids basis, at a temperature of about 80 degrees C until said mixture is substantially homogeneous;

(c) slowly admixing the heated water phase obtained in step (b) into the heated oil phase obtained in step (a);

(d) thereafter mixing the resulting heated composition until a substantially homogeneous and uniform emulsion is formed;

(e) thereafter sequentially cooling the emulsion to a temperature below about 55 degrees C, admixing therein any portion of water containing alkali metal hydroxide previously withheld in step (b) (ii), and agitating the emulsion until a relatively viscous emulsion cream composition forms; and

(f) thereafter cooling the resulting composition relatively rapidly to ambient room temperature;

whereby when the alkaline material in step (b) is an alkaline earth hydroxide, the emulsion cream is convertible to a no-base, no-lye relaxer when it is admixed with an aqueous liquid activator and when the alkaline material withheld in step (b) (ii) and added in step (e) is alkali metal hydroxide, the emulsion cream is directly usable as a hair relaxer.

5,068,102

AGENT FOR THE LONG-LASTING SHAPING OF HAIR

Jürgen Tennigkeit, Seeheim, and Burkhard Rose, Darmstadt, both of Fed. Rep. of Germany, assignors to Goldwell AG, Darmstadt, Fed. Rep. of Germany

Filed Jun. 27, 1990, Ser. No. 544,743

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3920984

Int. Cl.[5] A61K *7/09*

U.S. Cl. 424—72 **12 Claims**

1. Agent for the permanent shaping of hair, said agent comprising a mixture of: (a) a thioglycolic acid ester; (b) from 10 to 60% of said thioglycolic acid ester of 2-mercaptopropionic acid monoglycerol ester; and (c) at least one solubilizer.

5,068,103

SALBUTAMOL-CONTAINING PLASTER AND METHOD OF PRODUCING SAME

Toshikuni Kawazi; Masahiro Ono, and Nobuko Inoue, all of Kagawa, Japan, assignors to Teikoku Seiyaku Kabushiki Kaisha, Kagawa, Japan and Chiesi Farmaceutici S.p.A., Parma, Italy

Filed Sep. 8, 1988, Ser. No. 241,458

Claims priority, application Japan, Sep. 8, 1987, 62-224487

Int. Cl.[5] A61K *31/74, 31/78, 9/70, 31/135*

U.S. Cl. 424—81 **9 Claims**

1. A salbutamol-containing plaster which comprises an adhesive preparation containing a macromolecular substance selected from the group consisting of natural rubber, polyisoprene, polybutadiene, styrene-isoprene-styrene block copolymers, polyacrylic esters, polymethacrylic esters, acrylic ester-methacrylic ester copolymers, acrylic acid-acrylic ester-vinyl acetate copolymers and petroleum resins in an amount of 20–70%, and a metal ion sequestering agent selected from the group consisting of ethylene diamine tetraacetic acid, potassium polyphosphate, sodium polyphosphate, potassium metaphosphate, sodium metaphosphate, dimethylglyoxime, 8-hydroxyquinoline, nitrilotriacetic acid, dihydroxyethylglycine, gluconic acid, citric acid and tartaric acid in an amount of 0.01–2%, and an effective amount of salbutamol or a pharmaceutically acceptable salt thereof in an amount of 1–6% incorporated in said adhesive preparation, the salbutamol-containing adhesive preparation being spread on a support to form a salbutamol-bearing layer.

5,068,104

LIVE VACCINE FOR COCCIDIOSIS UTILIZING COCCIDIAL SPOROZOITES

Balbir S. Bhogal; Michael G. Williams, both of Midlothian, and Glenn A. Miller, Richmond, all of Va., assignors to A. H. Robins Company Incorporated, Richmond, Va.

Filed Aug. 1, 1988, Ser. No. 226,894

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] A61K *39/00, 9/48*

U.S. Cl. 424—88 **5 Claims**

1. A method of vaccinating chickens against coccidiosis disease, which method comprises:

(a) treating with a chelating agent a microcapsule containing internally, inside of a microcapsule wall, a suspension of live excysted *Eimeria tenella* sporozoites, physiologically balanced with respect to isotonicity and pH further comprising at least one water-soluble viscosity enhancing polymeric substance selected from the group consisting of hydrosols, gels, gelatins, cellulose, cellulose derivatives and polysaccharide gums in amount sufficient to significantly prolong viability of said sporozoites and said microcapsule wall comprised of hardened polymeric substance; and

(b) administering to said chickens said treated microcapsule.

5,068,105

FUNGAL FORMULATION FOR BIOCONTROL OF SOILBORNE PLANT PATHOGENS

Jack A. Lewis, Columbia; Douglas Lumsden, Bowie; George Papavizas, Beltsville; Martha D. Hollenbeck, Hyattsville, and James F. Walter, Ashton, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y. and The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 13, 1989, Ser. No. 322,445

Int. Cl.[5] A61K *35/70;* **C12N** *1/14;* **A01N** *63/04*

U.S. Cl. 424—93 **25 Claims**

1. A biocontrol preparation for control or prevention of plant fungal diseases which is a mixture of a porous carrier and sporulated biomass of one or more species of fungus effective for control of soilborne plant diseases, said biomass having been grown under liquid fermentation conditions, separated from the fermentation medium, treated with a dilute acid to reduce bacterial contamination, and dried to temporarily inactivate and stabilize the mixture, said biomass/carrier mixture subsequently having been moistened and activated by incubation with dilute acid and a nutrient base for a sufficient time to allow for visible fungal growth prior to applying to soil or growth medium.

5,068,106

T-PA SOLUTION OF HIGH CONCENTRATION AND USE OF THE SOLUTION IN HUMAN AND VETERINARY MEDICINE

Eric P. Pâques, Marburg, and Hans-Arnold Stöhr, Wetter, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 201,880

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718890

Int. Cl.[5] A61K *37/547, 37/54;* **C12N** *9/64, 9/72*

U.S. Cl. 424—94.3 **13 Claims**

1. A process for the preparation of a protein solution having tissue plasminogen activator (t-PA) activity, comprising

preparing a solution containing t-PA in the one- or two-chain form, or a solution containing a derivative of said t-PA which occurs naturally or which has been prepared by synthesis or genetic manipulation; and

adding to said solution 0.001 to 1 mol/l of arginine and 0.001 to 1 mol/l of lysine.

5,068,107

POLYMERIC ORTHODONTIC MEMBERS AND ORTHODONTIC TREATMENT METHOD

Daniel J. Hollibush, Kansasville, Wis.; Jeffery Fasnacht, Columbus, Ind., and Edward G. Eeg, Racine, Wis., assignors to Ortho-Vacon, Inc., Kansasville, Wis.

Continuation-in-part of Ser. No. 143,748, Jan. 14, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 286,316

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—435 **9 Claims**

1. A method for prevention and treatment of dental disease during a course of orthodontic treatment comprising:

mounting under tension in orthodontic force-applying positions, at treatment locations within the mouth, at least one force-applying polymeric elastic orthodontic member, the elastic member being an orally-acceptable substantially water-insoluble elastic polymeric material selected from the group consisting of natural rubbers, natural-synthetic rubbers, synthetic rubbers, and thermoplastic polymeric materials, and blends thereof, having suitable physical properties, with a dentally-active pharmacological agent uniform throughout the elastic polymeric material as an in situ constituent of polymeric-member formation from a homogeneous mixture of said polymeric material and said pharmacological agent, the elastic polymeric material having dispersed therein a composition which includes the pharmacological agent, such dispersed composition being present in an amount no more than about 30 parts by weight per 100 parts of the elastic polymeric material;

releasing the dentally-active pharmacological agent throughout the useful force-applying life of the polymeric elastic member, such release being where most needed and in therapeutically-acceptable concentrations, by maintaining said force-applying polymeric elastic member(s) at said orthodontic treatment location(s); and

at a time after the mounting step, removing and discarding the elastic orthodontic member and replacing it with an unused similar elastic orthodontic member, thereby to enhance continuous application of the dentally-active agent;

whereby protection against or treatment of dental disease is provided without compromising orthodontic force-applying elasticity of the orthodontic member, the protection provided by each such orthodontic member being provided over an extended period which is substantially commensurate with the useful life of force-applying elasticity of said orthodontic member.

5,068,108

CONTROLLED RELEASE PROTECTIVE MATRICES FOR ZOOTECHNICAL AND VETERINARY USE

Luigi Fezzi, and Giacomo Grassigli, both of Modena, Italy, assignors to Industria Italiana Integratori Trei S.P.A., Modena, Italy

Filed Feb. 27, 1990, Ser. No. 485,997

Claims priority, application Italy, Mar. 3, 1989, 19639 A/89

Int. Cl.[5] A01N *25/08;* **A23K** *1/18;* **A61K** *9/62, 47/36*

U.S. Cl. 424—438 **2 Claims**

1. A rumen by-pass product for oral administration to a ruminant comprising a biologically active component supported by a protective matrix formed by lipogelling a saturated long chain fatty acid triglyceride with a polymeric material selected from methyl- and ethyl cellulose, cellulose acetophthalate, polyvinyl and polyoxyethylene alcohol and polyacrylates, and transforming the matrix into a paste by the addition thereto of a colloidal material selected from starch, kaolin, bentonite and silica.

5,068,109

ANTACID COMPOSITION

Jorgen Foldager, Snekkersten; Helle Toftkj r, N rum, and Kim Kjorn s, V rlose, all of Denmark, assignors to Farma Food A/S, Glostrup, Denmark

PCT No. PCT/DK88/00062, § 371 Date Dec. 5, 1989, § 102(e) Date Dec. 5, 1989, PCT Pub. No. WO88/07862, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 6, 1988, Ser. No. 424,222

Claims priority, application Denmark, Apr. 8, 1987, 1796/87

Int. Cl.[5] A61K *9/28*

U.S. Cl. 424—441 **23 Claims**

1. An antacid composition which comprises

i) a low-methoxylated pectin having a degree of methoxylation of not more than 15%, or an alkali salt metal or amidated derivative thereof, which is capable of forming a gel structure at an acid pH;

ii) one or more acid neutralizing agents capable of being trapped in said gel structure formed by said low-methoxylated pectin at an acid pH, at least one of said acid neutralizing agents which cause said gel to foam when contacted with an acid and which is selected from the group consisting of alkali metal and alkaline earth metal salt, an aluminum salt, an ammonium or a bismuth salt, said salt being a carbonate, bicarbonate, subcarbonate or a mixture thereof; and

iii) optionally, a substance which is capable of acting as a buffer and capable of being captured in said gel structure formed by said low-methoxylated pectin at an acid pH, said substance iii) being selected from the group consisting of proteinaceous substances, sodium, calcium, magnesium,

ammonium, aluminum and potassium phosphates; casein or caseinates; milk powder; gelatin and amino acids, or a salt thereof;

said composition having raft-forming properties in a gastric environment.

5,068,110

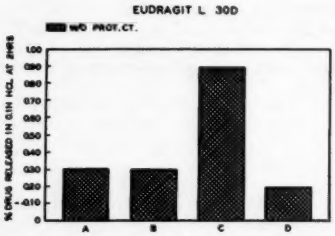
STABILIZATION OF ENTERIC COATED DOSAGE FORM

Mahdi B. Fawzi, Flanders; Daniel A. Kubert, Lafayette, and Kuchi S. Murthy, Morris Plains, all of N.J., assignors to Warner-Lambert Co., Morris Plains, N.J.

Continuation of Ser. No. 102,179, Sep. 29, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 379,727

Int. Cl.[5] A61K *9/62*

U.S. Cl. 424—461 **8 Claims**



1. An enteric coated pharmaceutical capsule having acetates or derivatives thereof comprising cellulose acetate phthalate or polyvinyl acetate phthalate as the enteric coatign where in the improvement is an enteric coating level consisting of from 14 mg/cm_2 to 24.0 mg/cm_2 and a protective coating comprising a hydrophilic coating comprising hydroxypropyl cellulose, hydroxymethyl cellulose or hydroxypropylmethyl cellulose.

5,068,111

PHARMACEUTICAL TABLETS AND CAPSULE GRANULATES OF SCLEROGLUCAN AND ACTIVE SUBSTANCE

Mara L. Lovrecich, Trieste, and Giovanna Riccioni, Rome, both of Italy, assignors to Vectorpharma International S.p.A., Trieste, Italy

Filed Mar. 17, 1989, Ser. No. 324,736

Claims priority, application Italy, Mar. 17, 1988, 19816 A/88

Int. Cl.[5] A61K *9/16, 9/26, 9/52*

U.S. Cl. 424—469 **2 Claims**

1. Pharmaceutical formulation for oral administration with controlled release of the active substance and with improved bioadhesion characteristics, comprising scleroglucan and an active substance selected from the group consisting of benzamide and theophylline in an amount of between 5 and 60% by weight and pharmaceutical acceptable excipients selected from the group consisting of polyethylene glycol, gum arabic, calcium chloride, aerosil, sodium borate and stearic acid and being present in an amount of between 5 and 40% by weight, said formulation being prepared by mechanically mixing said scleroglucan, said active substance and said pharmaceutical acceptable excipients in solid state and directly compressing to form a controlled release formulation in tablet form.

5,068,112

CONTROLLED RELEASE PHARMACEUTICAL PREPARATION AND METHOD FOR PRODUCING THE SAME

Masayoshi Samejima, Mino; Kazuo Noda, Takarazuka; Yoshiyuki Hirakawa, Toyonaka, and Hiroyuki Yoshino, Suita, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Mar. 24, 1989, Ser. No. 329,408

Claims priority, application Japan, Mar. 31, 1988, 63-80604

Int. Cl.[5] A61K *9/16*

U.S. Cl. 424—495 **6 Claims**

1. A controlled release pharmaceutical preparation comprising:

(A) a core containing a pharmaceutically active ingredient and succinic acid; and

(B) a porous cellulose film formed on the surface of said core by spraying a water-organic solvent mixture containing ethyl cellulose or a mixture of ethyl cellulose and hydroxypropyl cellulose, said porous cellulose film having a porosity of about 0.4 to 0.9 calculated according to the formula:

$$1 - \frac{\text{(total weight of film)/(total volume of film)}}{\text{(true specific gravity of film)}}$$

5,068,113

CHLOROFIBERS WITH PERMANENT ANTISEPTIC CHARACTER AND PROCESS FOR THEIR PRODUCTION

Michel Bourgeois, Lyons; Roger Chatelin; Daniel Wattiez, both of Lissieu Par Lozanne; Michel Sotton, St Cyr Au Mont d'Or; François Belet, Tronville en Barrois, and Georges Achard, Decines, all of France, assignors to Institut Textile de France and Rhovyl, both of, France

Filed Sep. 20, 1989, Ser. No. 409,809

Claims priority, application France, Sep. 27, 1988, 88 13059

Int. Cl.[5] A01N *25/34;* **A61K** *9/14, 33/28;* **C07F** *3/12*

U.S. Cl. 424—496 **9 Claims**

1. A fibrous polymeric material based on polyvinyl chloride which contains at least one antiseptic mercury derivative distributed in its polymeric structure in the form of a substantially molecular and practically non-releasable dispersion, said derivative being present in a concentration of at least 0.25 mg of mercury/g of chlorofiber and containing at least one benzene ring and comprising on the one hand at least one radical HgX, in which X is selected from F, Cl, Br, I, OH, CH_3COO, CN, SCN, NO_3 and $OB(OH)_2$, and on the other hand, bonded to a benzene ring, at least one group —OR or —COOR, in which R is a functional group which is capable of partaking in a polymerization or polyaddition reaction, said derivative being not fixed on the polymeric structure of the material by a reaction of polymerization or of polyaddition, but being distributed on its polymeric structure in the form of a molecular and practically non-releasable dispersion.

5,068,114

ANIMAL FEED BLOCK COMPOSITION

Michael J. Chanen, St. Louis Park, and Robert W. Roskowiak, St. Paul, both of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 6, 1989, Ser. No. 446,997

Int. Cl.[5] A23K *1/22*

U.S. Cl. 426—69 **24 Claims**

1. A two part composition for forming a weather resistant, stackable animal feed block upon mixing of the parts, the composition comprising a first flowable premix including from about 65% to about 80% of cane molasses, from about 3.0% to about 4.5% of dissolved calcium chloride, from about 3.3% to about 7.0% fat, from about 5.75% to about 8% water, and from about 4.9% to about 8.5% urea prills, said first premix having

a pH from about 4.4 to about 5.5, the first premix substantially free of divalent cations other than Ca^{2+} ions and not increasing in viscosity more than about 3½ times with the mixture of $CaCl_2$ therein; and a second liquid premix containing water soluble salts of orthophosphoric acid, said second premix having a pH from about 5.0 to about 6.2, the first and second premixes when combined having a pH between about 4.0 and about 6.0, wherein the ratio of the first premix to the second premix is in the range of from about 1.84:1 to about 6.82:1, the ratio of dissolved calcium in the first premix to dissolved phosphorous in the second premix is in the range of between about 0.26:1 and about 0.32:1 and forming the weather resistant, stackable animal feed block upon mixing, which block has a hardness of more than about 4 in about 6 hours.

5,068,115

METHOD FOR CLEANING EDIBLE OILS USING AN IMMERSIBLE PACKET CONTAINING CITRUS PEELS AND A PACKET FOR CLEANING EDIBLE OILS

Benno E. Liebermann, Louisville, Ky., assignor to Beltec International, Louisville, Ky.

Filed Jan. 3, 1991, Ser. No. 638,479
Int. Cl.[5] A23D *9/00*
U.S. Cl. 426—77 **26 Claims**

1. An immersible packet for cleansing of a heated cooking oil, said packet comprising:

a sealed enclosure formed from an oil porous material, said material when immersed in the heated cooking oil for at least thirty minutes being stable against heated oil to temperatures of at least 350° Fahrenheit;

an antioxidant carried with the ground rind of a fruit, said fruit containing citric acid and ascorbic acid, said rind containing a volatile essential oil, said ground rind substantially filling said enclosure; and

said porous material having pores large enough to permit release of water vapor from within said enclosure, but small enough to prevent escape of rind pieces through said material;

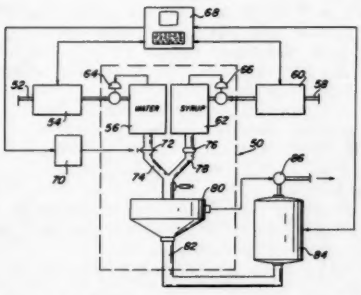
such that when immersed in said heated cooking oil said packet inhibits accelerated generation of free fatty acids and other organic contaminants while volatilizing said essential oil to produce a pleasing aroma.

5,068,116

METHOD FOR BEVERAGE BLENDING AND PROPORTIONING

Michael W. Gibney, Ingleside; Lawrence M. Lucas, Corpus Christi, and Roy Culver, Jr., Ingleside, all of Tex., assignors to Micro-Blend, Inc., Ingleside, Tex.

Continuation-in-part of Ser. No. 416,813, Oct. 3, 1989, abandoned. This application Feb. 20, 1990, Ser. No. 482,363
Int. Cl.[5] A23L *2/00*
U.S. Cl. 426—23.1 **18 Claims**



1. A method of proportioning and blending a beverage comprising the steps of: providing a flow of water into a proportioner, providing a flow of beveraged syrup into a proportioner, determining the mass flow rate of the water and the syrup, calculating a volumetric flow rate for the water and the syrup as a function of the mass flow determination, blending the water and syrup in exact proportions, and adjusting the proportion of the water to the syrup in the blend as a function of the calculated values and a previously set value for the blend.

5,068,117

METHOD OF PRODUCING SIMULATED MEAT PRODUCT FROM WHOLE SOYBEANS

Edward M. McCabe, Marysville, Ohio, assignor to Nestec S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 318,793, Mar. 3, 1989, Pat. No. 4,943,441. This application Jul. 23, 1990, Ser. No. 556,139
The portion of the term of this patent subsequent to Jul. 24, 2007, has been disclaimed.
Int. Cl.[5] A23J *3/22*
U.S. Cl. 426—511 **12 Claims**

1. A method of processing whole soybeans to produce a textured soy protein product in the form of discrete chunks free from off-flavors and odors, which consists essentially of

hydrating and acidifying whole soybeans to a pH in the range of between about 4.5 to 6.5

comminuting the hydrated and acidified whole soybeans with water and sufficient vegetable protein isolate to provide an aqueous dispersion of soybean particles containing from about 40% to 60% by weight protein on a moisture free basis, with the aqueous dispersion having a pH in the range of between about 4.5 to 6.5 and a solids content of about 10% to 45% by weight,

introducing the aqueous dispersion into a confined treatment zone,

injecting pressurized steam into a confined stream of the aqueous dispersion in said treatment zone under conditions sufficient to rapidly denature protein in said dispersion and texturize the protein into discrete chunks of texturized protein, and

discharging the texturized protein from said treatment zone in the form of discrete, chunks which are free of off-flavors and odors.

5,068,118

METHOD OF MAKING SIMULATED CHEESE CONTAINING CASEIN MATERIALS

John J. Strandholm, Morton Grove, Ill., assignor to Kraft General Foods, Inc., Glenview, Ill.

Filed Jul. 25, 1990, Ser. No. 557,698
Int. Cl.[5] A23C *20/00*
U.S. Cl. 426—582 **16 Claims**

1. A method for controlling the texture, firmness and melting properties of a simulated cheese product comprising providing a protein material wherein at least a portion of said protein material is a modified casein material selected from the group consisting of alpha-S-1 casein, alpha-S-2 casein, beta casein, kappa casein, gamma casein, dephosphorylated native casein, dephosphorylated alpha-S-1-casein, dephosphorylated alpha-S-2-casein, dephosphorylated beta casein, dephosphorylated gamma casein, dephosphorylated kappa casein and mixtures thereof, admixing said protein material continuing modified casein material with water and heating said admixture with agitation to provide said simulated cheese.

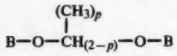
5,068,119

ACID-HYDROLYZABLE ESTER DERIVATIVES AS LOW CALORIE FAT MIMETICS

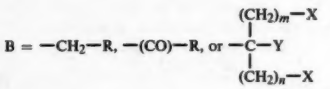
Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Sep. 28, 1990, Ser. No. 590,298
Int. Cl.[5] A23D *9/00*
U.S. Cl. 426—601 **22 Claims**

1. A food composition comprising fat ingredients and nonfat ingredients, wherein said fat ingredients are partially or fully replaced by a fat mimetic compound of the formula



where



X=H, an alkyl having 1 to 4 carbons, —O—(CO)—R, or —(CO)—O—R, or mixtures thereof,
Y=H, an alkyl having 1 to 4 carbons, or —(CO)—O—R,
R=an aliphatic group having 1 to 29 carbons,
m=0, 1, or 2,
n=0, 1, or 2, and
p=0 , 1 or 2.

5,068,120

AMINE ESTER DERIVATIVES AS LOW CALORIE FAT MIMETICS

Ronald G. Yarger, Covent Station; Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Aug. 1, 1990, Ser. No. 561,099
Int. Cl.[5] A23D *9/00*
U.S. Cl. 426—611 **23 Claims**

1. An edible composition comprising, in addition to other edible ingredients, a fat mimetic compound of the following formula:

where
B is an aliphatic group having from 2 to 12 carbons, each R is, independently, an aliphatic group having 1 to 30 carbons,
X=H or R, independently, m=1 to 2, and n=1 to 7.

5,068,121

PRODUCT AND PROCESS FOR PREPARING A PLANT FIBER PRODUCT

Sven K. Hansen, Pjedsted, and Anders H. Balle, Strib, both of Denmark, assignors to Fredericia Cellulose A/S, Fredericia, Denmark

Filed Nov. 21, 1989, Ser. No. 439,665
Claims priority, application Netherlands, Oct. 19, 1989, 5188/89
Int. Cl.[5] A23K *1/00*; A23L *1/277*
U.S. Cl. 426—636 **14 Claims**

1. A process for preparing a fiber-containing food additive from a cereal straw containing lignin, said process consisting essentially of subjected a product obtained from cutting and purifying said cereal straw to the following successive treatment steps:

(i) cooking the product in a liquor containing sodium hydroxide at a positive pressure and without the addition of a sulphate or a sulphite;
(ii) treating the product with ClO_2 in an acid medium;
(iii) treating the product with H_2O_2 in a basic medium;
(iv) treating the product with ClO_2 in an acid medium; and
(v) drying and grinding the product to obtain said food additive,

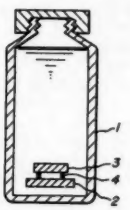
whereby substantially all lignin is removed from said product, and said food additive has a whiteness greater than 80 according to the Iso-standard.

5,068,122

PROCESS FOR FORMING A BIOACTIVE HYDROXYAPATITE FILM

Tadashi Kokubo, Nagaokakyo City; Takao Yamamuro, Muko City, and Yoshio Abe, Kyoto City, all of Japan, assignors to Kyoto University, Kyoto City, Japan

Filed Nov. 8, 1989, Ser. No. 435,206
Claims priority, application Japan, Mar. 29, 1989, 1-74829
Int. Cl.[5] B05D *7/24*
U.S. Cl. 427—2 **1 Claim**



1. A process for forming a bioactive hydroxyapatite film on a surface of a substrate, comprising the steps of:

arranging the substrate and a glass comprising 20–60 mol % CaO and 40–80 mol % SiO_2, wherein the total amount of CaO and SiO_2 in the glass is at least 70 mol %, in a face-to-face relation at a distance of at most 2 mm apart; and

soaking the thus arranged substrate and glass in an aqueous solution comprising hydroxyapatite constituents Ca and P as a solute in amounts of 0.1–10 mM as Ca^{+2} ion and 0.1–50 mM as HPO^{-2} ion, at a pH in the range of 5–9 and a temperature in the range from 5–70° C. to form a bone-like hydroxyapatite film on the surface of the substrate, wherein the positioning of the substrate surface near the glass surface provides a concentration of hydroxyapatite constituents at the substrate surface which is higher than the concentration in the bulk of the solution.

5,068,123

PROCESS FOR PRODUCING RECORDING MEDIUM AND APPARATUS THEREFOR

Hiroshi Goto, Yokohama; Toshiaki Harada, Kawasaki, and Noriyoshi Ishikawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,240
Claims priority, application Japan, Aug. 30, 1988, 63-213686; Nov. 11, 1988, 63-283834; Dec. 6, 1988, 63-306838
Int. Cl.[5] B05D *1/40, 3/02, 3/12*
U.S. Cl. 427—32 **12 Claims**

1. A process for producing a recording medium comprising a substrate and a plurality of image forming elements disposed thereon, which comprises the steps of:

applying a binder onto the substrate to form thereon a binder layer;

disposing the image forming elements on the binder layer; and

simultaneously applying a vibration and a pressure in a

direction toward the substrate to the image forming elements disposed on the binder layer sufficient to bond the

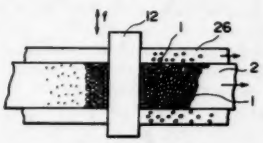


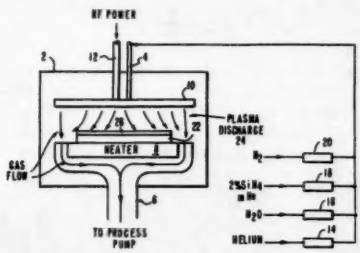
image forming elements to the substrate as a substantially monoparticle layer.

5,068,124

METHOD FOR DEPOSITING HIGH QUALITY SILICON DIOXIDE BY PECVD

John Batey, and Elaine Tierney, both of Danbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1989, Ser. No. 438,920
Int. Cl.[5] C23C *16/40, 16/50*
U.S. Cl. 427—39 20 Claims



1. A method for depositing high quality silicon dioxide on a substrate in a plasma-enhanced chemical vapor deposition tool, comprising the steps of:

(a) introducing an oxygen containing reactant gas and a silicon containing reactant gas into said tool, said silicon containing reactant gas being diluted in an inert carrier gas, the flow rate of said diluted silicon containing carrier gas being 200 sccm or greater;

(b) introducing a flow of said inert carrier gas at a flow rate of 1000 sccm or greater into said tool; and

(c) establishing a plasma discharge in said tool by applying RF power density of about 1 W/cm^2 or greater, thereby depositing a layer of high quality silicon dioxide on said substrate.

5,068,125

PROCESS FOR THE PRODUCTION OF COATINGS BASED ON UNSATURATED POLYESTER RESINS BY HARDENING UNDER INFRA-RED RADIATION

Jürgen Meixner; Horst Clemens, and Armin Sickert, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 427,776, Oct. 27, 1989, abandoned. This application Aug. 27, 1990, Ser. No. 572,348
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 3837783
Int. Cl.[5] B05D *3/06;* C08G *63/66*
U.S. Cl. 427—55 2 Claims

1. In the process for the production of coatings on a substrate by applying to the substrate a composition containing an unsaturated polyester resin as the binder and subsequently hardening the coating thus obtained by infra-red radiation,

the improvement comprises having the composition contain, as the binder, a monomer-free olefinically unsaturated polyester resin having a viscosity of 2,000 to 5,000 mPa.s at 23° C. and consisting essentially of the reaction product of:

A) 1.0 mol of an unsatured dicarboxylic acid component selected from the group consisting of maleic acid, maleic anhydride, fumaric acid and mixtures thereof,

B) 0.5 to 1.2 mol of a diol component which is a dihydric alcohol with 2 to 8 carbon atoms,

C) 0.5 to 1.1 mol of at least one unsaturated ether component which is a monofunctional hydroxy compound containing one or more β,γ-ethylenically unsaturated alkenyl ether moieties in the molecule, and

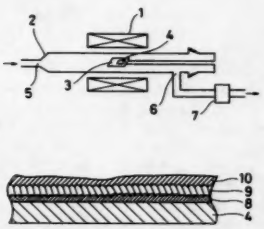
D) 0 to 0.55 mol of an alcohol component which is a saturated monohydric alcohol with 4 to 10 carbon atoms.

5,068,126

PROCESS FOR PRODUCING GRAPHITE ELECTRODES

Tomonari Suzuki, Kashihara; Hiroshi Wada, Nara; Yoshikazu Yoshimoto, Tenri, and Masaru Yoshida, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1989, Ser. No. 318,339
Claims priority, application Japan, Mar. 4, 1988, 63-51821
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—122 17 Claims



1. A process for producing a graphite electrode which comprises the steps of:

forming a deposition layer of fine globular graphite particles on a substrate, wherein the fine globular graphite particles have a size of 1 to 10 μm; and

conducting one or more times a laminating step of forming a metal film on the deposition layer and subsequently forming a graphite layer on the metal film, to obtain an electrode having one or more of the graphite layers supported on the substrate wherein the metal film is a nickel or iron film which has a thickness of 1 to 10 μm.

5,068,127

PROCESS AND APPARATUS FOR THE SIMULTANEOUS DEPOSITION OF A PROTECTIVE COATING ON INTERNAL AND EXTERNAL SURFACES OF HEAT-RESISTANT ALLOY PARTS

Jean-Paul Fournes, Milly la Foret, and René J. Morbioli, Corbeil, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

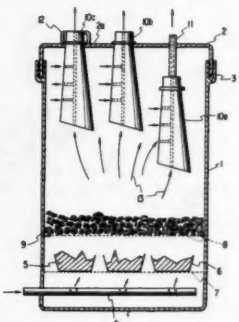
Filed Jun. 29, 1989, Ser. No. 372,889
Claims priority, application France, Jun. 30, 1988, 88 08801
Int. Cl.[5] C23C *16/22, 16/46, 10/48, 10/34*
U.S. Cl. 427—237 9 Claims

1. A process for the simultaneous deposition of a protective coating on both external and internal surfaces of at least one heat-resistance object comprising the steps of:

providing a box comprising a donor of a metal to be deposited on said at least one object to be coated and, separately from said donor, an activator constituting a source of fluorine, said activator comprising a source of fluorine

exhibiting a slow kinetic decomposition process in a range of temperatures of the deposition process;

locating said at least one object to be coated in said box, wherein a portion of said object not to be coated is placed outside of said box, wherein said internal surfaces of said at least one object to be coated define at least one passage through said object to be coated, wherein said at least one object to be coated is located in said box so that gases can escape from said box through said at least one passage through said at least one object to be coated, and wherein said at least one passage has an intake turned toward a direction of circulation of said fluorinated vapors;



heating said box to a temperature above 1000° C. to generate fluorinated vapours by thermal decomposition of said fluorine source from said activator; and

introducing a controlled flow of a carrier gas into said box so as to cause circulation of gases within said box whereby said fluorinated vapours contact said donor to form a volatile fluoride vapour of said metal to be deposited and said volatile metal fluoride vapour is carried into contact with said external and internal surfaces of said at least one object to be coated to deposit said metal on said object to be coated and thereby form said protective coating thereon.

5,068,128

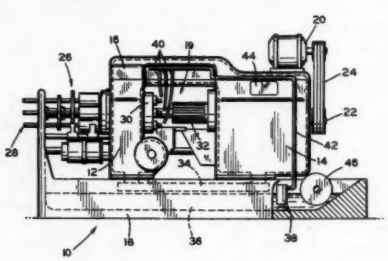
Patent Not Issued For This Number

5,068,129

PROCESS FOR CONVERTING A FLUID SYSTEM OF A MACHINE FROM AN OIL BASED FLUID SYSTEM TO A WATER BASED FLUID SYSTEM

Morton R. Smith, Napoleon, and James L. Maassel, New Bavaria, both of Ohio

Filed Jul. 12, 1990, Ser. No. 552,245
Int. Cl.[5] B08B *3/08*; B05D *7/22*
U.S. Cl. 427—239 **11 Claims**



1. A process for converting a fluid system of a machine from an oil based fluid system to a water based fluid system, comprising the steps of:

(A) adding sufficient amounts of a solvent and a perfluoroethylene resin to the oil based fluid in the fluid system of the machine to remove oil residue or varnish from the surfaces within the fluid system, and to coat the surfaces with perfluoroethylene resin;

(B) circulating the oil based fluid, solvent and perfluoroethylene resin throughout the fluid system for a time sufficient to remove oil residue or varnish from the surfaces within the fluid system of the machine, and to coat the surfaces with perfluoroethylene resin;

(C) evacuating the oil based fluid, solvent and residual perfluoroethylene resin from the fluid system of the machine; and

(D) adding a water based fluid to the fluid system of the machine.

5,068,130

INHIBITION OF POLYMER FORMATION ON SURFACES INCLUDING VENTS BY USING AN INHIBITOR PAINT

Raymond L. Decolibus, Circleville, Ohio, assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1990, Ser. No. 601,971
Int. Cl.[5] B05D *7/22*; C08F *2/00*
U.S. Cl. 427—230 **5 Claims**

1. A process for inhibiting polymerization of methacrylate or acrylate monomer on interior surfaces of vents, conduits or non-polymerizing process vessels, which comprises coating such surfaces with paint consisting essentially of a water-base film former and phenothiazine, curing the paint, and exposing the surfaces to such monomer.

5,068,131

METHOD FOR PRODUCTION OF ELECTRONIC COATINGS

Allan A. Eisenbraun, and Wesley C. Blocker, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 255,747, Oct. 11, 1988, Pat. No. 4,997,869.
This application Sep. 13, 1990, Ser. No. 581,911
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—240 **8 Claims**

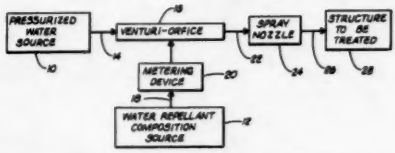
1. A method of forming a coating upon a planar substrate which comprises (a) applying to the central region of the planar surface a partially fluorinated polyimide composition, hereinafter specified, (b) rotating the substrate at a speed sufficient through centrifugal effect to cause the composition to flow outwardly toward the perimeter of the surface and form a substantially uniform liquid coating thereon, and (c) drying the coating by heating the same to an elevated temperature; said composition comprising a solution of (i) a 2,2-bis(3,4-dicarboxyphenyl)hexafluoropropane dianhydride/2,2-bis[4-(aminophenoxy)phenyl]hexafluoropropane polyimide polymer having an inherent viscosity in the range of about 0.05 to about 1.5 dL/g (as measured in N-methylpyrrolidone at room temperature at a concentration of 0.5 g/dL) in (ii) a solvent containing at least 40% by weight of one or more liquid aromatic hydrocarbons having a boiling point of at least about 110° C. and at least 5% by weight of one or more dipolar aprotic solvents having a boiling point of at least about 150° C., such that said solution (a) contains on a weight basis from about 5% to about 50% of such polyimide, and (b) does not undergo precipitate formation during spin coating in an atmosphere of up to about 55% relative humidity; said method being further characterized in that it is conducted in an atmosphere having a relative humidity that does not result in such precipitate formation during the rotation in (b).

5,068,132

METHOD FOR APPLYING A WATER REPELLANT COMPOSITION WITH A WATER CARRIER USING A DISPERSING MEANS

Dean E. Brunken, Edmond, and Arnulf P. Hagen, Noble, both of Okla., assignors to Advanced Chemical Technologies Company, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 214,174, Jul. 1, 1988, Pat. No. 4,931,319. This application May 2, 1990, Ser. No. 518,062
The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.
Int. Cl.[5] B05D *1/02*
U.S. Cl. 427—421 15 Claims



1. A method for treating siliceous and/or carbon central structures at a site with a water repellant composition comprising the steps of:

mixing an effective amount of water repellant composition with water to obtain a dispersion of water and water repellant composition;

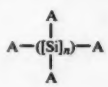
sufficiently further dispersing the water repellant composition in order to enhance the area of the structure treated with the water repellant composition;

applying the dispersion of water repellant composition and water to the structure in a continuous process at the site immediately within about 5 seconds after the water repellant composition and the water are mixed; and

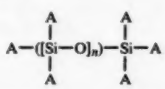
wherein the water repellant composition comprises a silane or siloxane or combinations thereof and, wherein the silane has the general formula:

a silane or a siloxane or combination thereof; and

wherein the silane has the general formula:



wherein the siloxane has the general formula:



wherein Si is silicon; O is oxygen; n is a positive integer; and A is selected from the group consisting of H, R,or X,

H is a hydrogen atom;

R is selected from the group consisting of an alkyl containing from about 1 to about 30 carbon atoms, an alkenyl group, an aryl group, a cycloalkyl group, a cycloalkenyl group, an arylalkyl group, an arylalkenyl group, or any substituted group thereof wherein the cyclo substituent contains from about 4 to about 8 carbon atoms, the alkyl substituent contains up to about 8 carbon atoms and the alkenyl substituent contains up to about 8 carbon atoms;

X is selected from a group consisting of a halogen, hydroxyl group, OR group wherein 0 is oxygen, a carboxylic group, or RNR or RNH wherein N is nitrogen; and

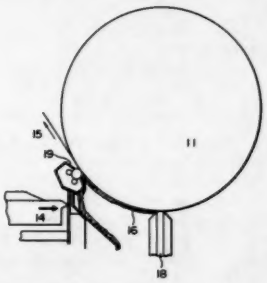
with the proviso that at least one A is X, and at least one A is R in the composition.

5,068,133

PROCESS FOR PRODUCING HEAT-SENSITIVE RECORDING MATERIAL USING ROLL BLADE COATING

Hisashi Matsumoto, Kobe, and Masaaki Takami, deceased, late of Kakogawa, Japan by Harumi Takami, successor , assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,894
Claims priority, application Japan, Oct. 27, 1987, 62-272524
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—358 12 Claims



1. A process for producing a heat-sensitive recording material comprising a support and formed thereon a color developing layer having a surface roughness Ra of 1.1 μm or less and a printing smoothness Rp of 7.8 μm or less under a pressure of 5 kg/cm^2, which comprises

coating a color developing composition solution comprising a color former and a color developer on a support using an applicator,

removing an excess color developing composition solution by a roll blade coating method, and

drying the resulting support.

5,068,134

METHOD OF PROTECTING GALVANIZED STEEL FROM CORROSION

James A. Cole; William O. Roberts, both of Wilmington, Del., and Joseph T. Turgeon, Parma, Ohio, assignors to Zaclon Corporation, Cleveland, Ohio

Continuation of Ser. No. 208,689, Jun. 20, 1988, abandoned. This application Dec. 19, 1989, Ser. No. 453,334
Int. Cl.[5] B05D *1/18, 1/36;* C23C *2/06*
U.S. Cl. 427—376.2 18 Claims

1. A process of protecting metal from white rust which comprises coating the metal with molten zinc or zinc alloy and subsequently directly contacting the zinc-coated metal at a metal temperature of at least 125° C. with a protective amount of a silica compound to form a chemically reacted coating with the zinc-coated metal, said silica compound being selected from the group consisting of sodium silicate, potassium silicate, an organic silicate, and silica.

5,068,135

AQUEOUS DISPERSIONS OF FLUORINATED POLYURETHANES AND THEIR USE FOR TEXTILE COATINGS

Ignazio Zavatteri, Cardano Al Campo, and Tiziana Gambini, Castellanza, both of Italy, assignors to Ausimont S.p.A., Milan and Larac S.p.A., Castellanza, both of, Italy

Division of Ser. No. 467,342, Jan. 22, 1990, Pat. No. 4,983,666, which is a continuation of Ser. No. 137,358, Dec. 22, 1987, abandoned. This application Oct. 12, 1990, Ser. No. 596,824
Claims priority, application Italy, Dec. 30, 1986, 22883 A/86
Int. Cl.[5] B04J *3/05*
U.S. Cl. 427—439 12 Claims

1. Process for preparing woven and non-woven textile arti-

cles comprising treating said textile articles by means of aqueous dispersions of fluorinated polyurethanes containing in their macromolecules hydrophilic ionic groups, both of anionic and cationic character, obtained by the process comprising the steps:

(a) preparing a fluorinated polyisocyanate, by reaction between an organic diisocyanate and a mixture comprising diols containing ionizable groups and macroglycols comprising polyols and at least 1% by weight of one or more hydroxy- and/or carboxy-capped fluoropolyoxyalkylene ethers;

(b) salifying the so-obtained fluorinated polyisocyanate, to convert the ionizable groups into hydrophilic cations or anions; and

(c) dispersing and chain extending the salified fluorinated polyisocyanate in water.

5,068,136

FIVE-LAYERED CONTAINER

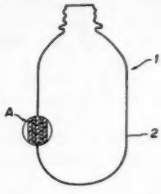
Yozo Yoshida; Tetuji Saitou, both of Hiratsuka, and Yoshiaki Momose, Hatano, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 284,119, Dec. 14, 1988, abandoned. This application Nov. 15, 1989, Ser. No. 436,787

Claims priority, application Japan, Dec. 22, 1987, 62-322697

Int. Cl.[5] B65D *23/00;* **B32B** *27/28*

U.S. Cl. 428—35.7 **9 Claims**



1. A five-layered container formed by biaxial orientation blow molding of an injection-molded, five layer-structure parison, wherein:

the central, innermost and outermost layers comprise resin A,

the intermediate layer between the innermost layer and the central layer comprises resin B,

the intermediate layer between the outermost layer and the central layer comprises resin B,

the resin A comprises a polyester resin containing ethylene terephthalate as the main recurring unit, and

the resin B comprises a mixture of a polyester resin containing ethylene terephthalate as the main recurring unit with polyarylate and a m-xylylene group-containing polyamide resin, or comprises a resin produced by an ester-exchange reaction of a polyester resin containing ethylene terephthalate as the main recurring unit with polyarylate and a m-xylylene group-containing polyamide resin.

5,068,137

RUBBERY LAMINATE AND COMPOSITE HOSE

Osamu Ozawa, Hiratsuka; Shuji Takahashi, Chigasaki, and Shigeru Igarashi, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Company, Japan

Filed Nov. 13, 1989, Ser. No. 434,243

Claims priority, application Japan, Nov. 14, 1988, 63-287424

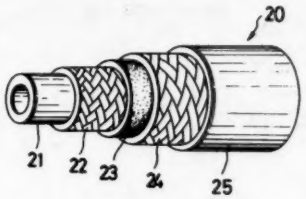
Int. Cl.[5] F16L *11/04;* **B32B** *1/08*

U.S. Cl. 428—36.2 **15 Claims**

1. A composite laminate comprising:

(a) a first rubbery layer formed from a rubber composition comprising 100 parts by weight of a copolymeric rubber having in the molecular chain an unsaturated nitrile unit in an amount of 10 to 45 percent by weight, a conjugated diene unit in an amount up to 5 percent by weight and either one or both of an ethylenically unsaturated unit other than said unsaturated nitrile unit and a hydrogenated conjugated diene unit in an amount of 50 to 90 percent by weight, 0.2 to 15 parts by weight of an organic peroxide curing agent and 1 to 20 parts by weight of magnesium oxide; and

(b) a second rubbery layer formed from a rubber composition comprising a rubber other than chlorosulfonated polyethylene rubber; and



(c) a fibrous layer formed from an organic fiber and interposed between said first and second rubbery layers, said fiber having been treated with a dip coating consisting essentially of 100 parts by weight of a vinyl pyridine-styrene-butadiene rubber latex, 0 to 100 parts by weight of a styrene-butadiene rubber latex and a resorcinol-formalin precondensate.

5,068,138

ELASTOMERIC FILM

Neil F. Mitchell, Santa Barbara, Calif., and Lie K. Djiauw, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 394,611, Aug. 16, 1989, Pat. No. 4,970,259. This application Jul. 23, 1990, Ser. No. 556,675

Int. Cl.[5] B29C *47/20*

U.S. Cl. 428—36.8 **16 Claims**

1. A process for making a blown film comprising the steps of:

a) providing a polymeric composition comprising:

i) from about 15 to about 85 parts by weight of a hydrogenated block copolymer comprising:

1) at least two blocks which are primarily polymerized alkenyl arene, and

2) at least one block which is primarily polymerized conjugated diene wherein the first hydrogenated block copolymer is from about 1 to about 60 percent by weight polymerized alkenyl arene, and the number average molecular weight of the first hydrogenated block copolymer is between about 55,000 and about 200,000 and the ethylenic unsaturation of the conjugated diene block has been reduced by hydrogenation to 20% or less of the original ethylenic unsaturation;

ii) an amount of a second hydrogenated block copolymer such that the amount of the first hydrogenated block copolymer plus the amount of the second hydrogenated block copolymer is 100 parts by weight, the second hydrogenated block copolymer comprising:

1) at least two blocks A, which are primarily polymerized alkenyl arene, and

2) at least one block B, which is primarily polymerized conjugated diene wherein the second hydrogenated block copolymer is from about 1 to about 60 percent by weight polymerized alkenyl arene and the number average molecular weight of the second hydrogenated block copolymer is between about 15,000 and about 85,000 and the ethylenic unsaturation of the conjugated diene block has been reduced by hydrogenation to 20% or less than that of the original ethylenic unsaturation;

iii) from about 5 to about 200 parts by weight per 100 parts by weight of the first plus the second block copolymer of a non-aromatic processing oil; and

iv) from about 5 to about 100 parts by weight per 100 parts by weight of the first plus the second block copolymer of a polymer which is compatible with each A block of the hydrogenated block copolymers.

b) extruding the polymeric composition through a heated die, the die having a gap between about 5 to about 120 mils;

c) expanding polymeric composition to a film having an average thickness of from 0.5 to 10 mils by application of differential pressure by a gas; and

d) rapidly cooling the extruded and expanded film.

2. The product of the process of claim 1 wherein the thickness of the film is between about 1.0 and about 5 mils, the number average molecular weight of the first hydrogenated block copolymer is between about 60,000 and about 110,000, the number average molecular weight of the second hydrogenated block copolymer is within the range of about 30,000 to about 60,000 and the ratio of the molecular weight of the first hydrogenated block copolymer to the ratio of the molecular weight of the second hydrogenated block copolymer is greater than 1.1:1.

5,068,139

COMPOSITE PAPER REINFORCED THERMOPLASTIC ARTICLE

Kent B. McReynolds, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 273,546, Nov. 21, 1988, Pat. No. 4,937,145. This application Nov. 14, 1989, Ser. No. 436,525

Int. Cl.[5] B32B *27/36, 18/00;* D21H *5/18*

U.S. Cl. 428—215 **20 Claims**

1. A multilayer structural article comprising (1) a composite paper core layer which has a thickness of from 0.4 to about 4 millimeters and which has two major surfaces and (2) a thermoplastic polymer layer adhered to each major surface of said core layer, said thermoplastic polymer layers each comprising one or more thermoplastic polymers and from 0 to about 25 weight percent, based on the weight of said thermoplastic polymer, of inorganic fibrous or particulate reinforcing or filler material; provided further that the ratio of the coefficient of linear thermal expansion (CLTE) of one of the thermoplastic polymer layers divided by the coefficient of linear thermal expansion of the other thermoplastic polymer layer is in the range of 0.85 to 1.15; and the composite paper core layer of said article has a resistance to delamination of 0.2 lbs/in (35 N/m) or greater.

5,068,140

TRANSPARENCIES

Shadi L. Malhotra; Maria L. Martins, both of Mississauga; Maya D. Stevanovic, Weston, and Arthur Y. Jones, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1989, Ser. No. 388,449

Int. Cl.[5] B41M *5/00*

U.S. Cl. 428—216 **17 Claims**

1. A transparent substrate material for receiving or containing an inked image comprised of a supporting substrate; an anticurl coating thereunder comprised of a first and second layer wherein the first layer in contact with the substrate is comprised of polymers containing hydrophilic and hydrophobic segments, and the second layer in contact with and present on the first layer is comprised of hydrophilic cellulosic polymers or acrylamide polymers; and an ink receiving layer wherein the supporting substrate is situated between the anticurl coating and the ink receiving layer.

5,068,141

POLYOLEFIN-TYPE NONWOVEN FABRIC AND METHOD OF PRODUCING THE SAME

Eiichi Kubo; Yoshihiro Kammuri; Koichi Nagaoka; Takeshi Kitahara; Yoshiki Miyahara, all of Uji; Syunichi Kiriyama, Gose, and Yasunobu Mishima, Uji, all of Japan, assignors to Unitika Ltd., Hyogo, Japan

Division of Ser. No. No. 56,544, Jun. 1, 1987, abandoned. This application Sep. 15, 1989, Ser. No. 408,184

Claims priority, application Japan, May 31, 1986, 61-126745; Feb. 3, 1987, 62-24332; Feb. 6, 1987, 62-26977

Int. Cl.[5] D02G *3/00;* D04H *1/04*

U.S. Cl. 428—219 **5 Claims**

1. A nonwoven fabric comprising filaments formed of linear low density copolymer of ethylene and octene-1, which is linear low density polyethylene, containing substantially 1–10 weight percent octene-1 and having a density of 0.900–0.940 g/cm^3, a melt index value of 5–45 g/10 minutes as measured by the D-1238(E) of ASTM, and a heat of fusion of not less than 25 cal/g as measured by DSC, said filaments being heat bonded together so that said nonwoven fabric has a number of defects not more than 0.01/kg of the fabric, a weight of 10–100 g/m^2, a percentage bond area of 7–20% and a total hand value of 4–300 g.

5,068,142

FIBER-REINFORCED POLYMERIC RESIN COMPOSITE MATERIAL AND PROCESS FOR PRODUCING SAME

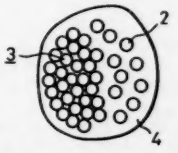
Kenkichi Nose, Ibaraki; Tadahiko Takata, Osaka, and Masuo Tsuge, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 12, 1990, Ser. No. 508,849

Claims priority, application Japan, Jan. 31, 1989, 1-19591; Apr. 17, 1989, 1-95387; Jan. 31, 1990, 2-19075

Int. Cl.[5] D03D *17/00;* B32B *7/00;* D02G *3/00;* B29C *47/00*

U.S. Cl. 428—232 **8 Claims**



1. A fiber-reinforced polymeric resin composite material comprising:

(A) a matrix consisting essentially of a thermoplastic polymeric resin; and

(B) a number of reinforcing individual fibers extending substantially in parallel to each other and embedded within the polymeric resin matrix in a manner such that 10 to 70% of the number of individual fibers are separated from each other through portions of the polymeric resin matrix, while the remaining individual fibers come into direct contact with each other to form at least one fiber bundle.

5,068,143

SHEET MATERIALS

Reginald T. Agger, Queniborough; John R. Taylor, Cosby, and Alan Hardy, Wigston Fields, all of England, assignors to Bostik, Inc., Middletown, Mass.

Filed Nov. 30, 1988, Ser. No. 278,293

Claims priority, application United Kingdom, Dec. 4, 1987, 8728358

Int. Cl.[5] B32B *5/16, 27/40*

U.S. Cl. 428—241 **8 Claims**

1. A heat formable sheet material comprising a woven or non-woven substrate with a polyesterurethane material as a

stiffening component, which polyesterurethane material comprises:

a) a polyester selected from the group consisting of polyethylene adipate, polyhexylene adipate and polytetramethylene adipate; and

b) an isocyanate, the mole ratio of the isocyanate groups to the hydroxyl groups of the isocyanate and the polyester being from about 0.75 to 1.1.

5,068,144

PERPENDICULAR MAGNETIC RECORDING MEDIUM AND METHOD FOR PRODUCING THE SAME

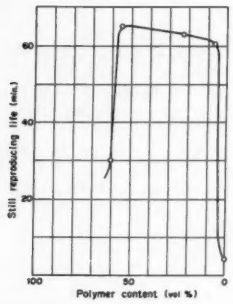
Osamu Kitakami, Toride; Hideo Fujiwara, Ibaraki; Kiyotaka Ojima, Ibaraki; Youichi Ogawa, Ibaraki, and Kunio Wakai, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 344,556, Apr. 25, 1989, abandoned, which is a continuation of Ser. No. 878,339, Jun. 25, 1986, abandoned. This application Oct. 1, 1990, Ser. No. 596,760

Claims priority, application Japan, Jun. 25, 1985, 60-136790

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—323 **21 Claims**



1. A perpendicular magnetic recording medium comprising a non-magnetic substrate and a magnetic layer which is formed on at least one surface of the substrate and comprises acicular particles of ferromagnetic metal oriented perpendicularly to a plane of the layer and an organic polymer filled in spaced between the acicular particles so as to surround the acicular particles, wherein a volume content of the organic polymer is about 5 to 55% by volume of the whole volume of the magnetic layer.

5,068,145

MAGNETIC RECORDING MEDIUM IN WHICH THE MAGNETIC LAYER CONTAINS A VINYL COMPOUND HAVING AN INNER SALT OF AN ALKYL AMINO ALKYL GROUP

Hideomi Watanabe, and Tsutomu Okita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1988, Ser. No. 192,792

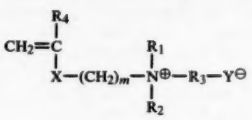
Claims priority, application Japan, May 11, 1987, 62-114048

The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—323 **12 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer comprising a binder and ferromagnetic particles dispersed therein, wherein said magnetic layer further contains a vinyl compound having an inner salt of a dialkylaminoalkyl group and said magnetic layer has been irradiated with radiation, and wherein said vinyl compound having an inner salt of a dialkylaminoalkyl group is represented by formula (I):


(I)

wherein

m represents an integer of from 1 to 4;

R_1 and R_2 each represents an alkyl group having from 1 to 6 carbon atoms:

R_3 represents an alkylene group having from 1 to 6 carbon atoms;

R_4 represents a hydrogen atom, a methyl group, or an ethyl group;

Y represents $—COO^{\ominus}$, $OPO_3^{\ominus}$, $—OPO_2^{\ominus}$, $—OSO_3^{\ominus}$, or $—OSO_2^{\ominus}$, $—NO_3^{\ominus}$, or $—NO_2^{\ominus}$; and

X represents —COO—, —CONH—, —NHCOO—, or —NHCONH—.

5,068,146

POLYMERIZED FILMS, MEDIUM RELATED MEMBERS, AND PROCESS FOR MAKING

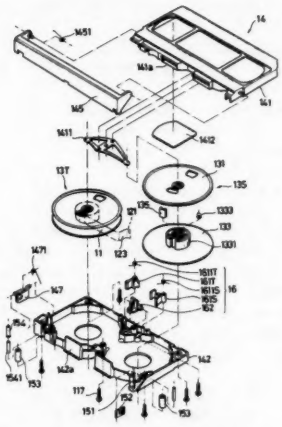
Masatoshi Nakayama; Kunihiro Ueda, and Masatoshi Okamura, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,260

Claims priority, application Japan, Mar. 3, 1988, 63-50428

Int. Cl.[5] B32B *15/08;* **B05D** *3/06, 3/14*

U.S. Cl. 428—336 **8 Claims**



1. A coated article, wherein a plasma-polymerized, metal element-containing film is formed on said article by a process comprising:

(i) passing a gaseous polymerizable reactant containing carbon C between electrodes formed of a material containing a metal element Mt; and

(ii) depositing and polymerizing the metal from said material and said polymerizable reactant in a plasma atmosphere, on said article,

wherein said process is carried out under a condition such that W/(F·M) is at least 10^8 joule/kg wherein W is the power applied for plasma generation in joule/sec, F is the flow rate of the gaseous reactant, and M is the molecular weight of the gaseous reactant, F·M being expressed in kg/sec, and

wherein said plasma-polymerized film contains the metal

element Mt and carbon c in an atomic ratio Mt/(C+Mt) of at least 1/100.

2. The coated article according to claim 1, wherein said plasma-polymerized film has a thickness of 10 to 1,000 Å.

5,068,147

SOFT MAGNETIC THIN FILM COMPRISING ALTERNATE LAYERS OF IRON CARBIDE WITH EITHER IRON, IRON NITRIDE OR IRON CARBON-NITRIDE

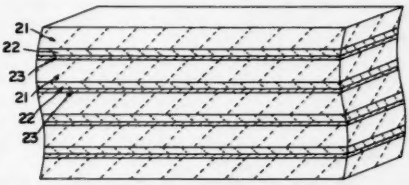
Tohru Hori, Ikoma; Masaki Aoki, Minou, and Kenichi Fujii, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 27, 1989, Ser. No. 345,722

Claims priority, application Japan, Apr. 28, 1988, 63-106372

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—336 15 Claims



8. A soft-magnetic thin film in which layers of iron carbide and layers of at least one of iron, iron nitride and iron carbon-nitride are alternately laminated, and a non-magnetic material layer is interposed between at least one pair of adjacent layers of the alternately laminated layers.

5,068,148

DIAMOND-COATED TOOL MEMBER, SUBSTRATE THEREOF AND METHOD FOR PRODUCING SAME

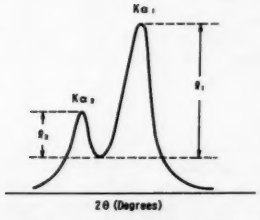
Kei Nakahara; Keiichi Sakurai; Toshihiko Okamura; Hironori Yoshimura, all of Tokyo; Hiroyuki Eto, and Noribumi Kikuchi, both of Omiya, all of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 454,513

Claims priority, application Japan, Dec. 21, 1988, 63-322764; Mar. 2, 1989, 1-50534

Int. Cl.[5] B32B *15/04, 33/00*

U.S. Cl. 428—335 3 Claims



1. A tool member having a tungsten carbide based cemented carbide substrate and a diamond coating deposited on said substrate, said substrate having two diffraction peaks $K\alpha_1$ and $K\alpha_2$ indexed by index of plane (211) for tungsten carbide in X-ray diffraction, said two diffraction peaks $K\alpha_1$ and $K\alpha_2$ satisfying the relationship of $L_1/L_2 \leqq 35$, where L_1 and L_2 are heights of said peaks $K\alpha_1$ and $K\alpha_2$ measured from a base of a trough between said two diffraction peaks, whereby a bonding strength between said substrate and said diamond coating is increased wherein said diamond coating has an average layer thickness of 0.5 μm to 20 μm, said tungsten carbide based cemented carbide containing, apart from unavoidable impurities, 1% by weight to 25% by weight of cobalt as a binder phase forming component and the balance tungsten carbide as a dispersed phase forming component.

5,068,149

WIRE MEMBER OF CEMENTED CARBIDE

Fumio Shimada, Yokohama, and Tadashi Kainuma, Tokorozawa, both of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 30,173, Mar. 25, 1987. This application Sep. 27, 1988, Ser. No. 249,909

Claims priority, application Japan, Mar. 28, 1986, 61-68432; Mar. 28, 1986, 61-68433

Int. Cl.[5] B32B *9/00;* B21C *1/00*

U.S. Cl. 428—367 3 Claims

1. A wire member of cemented carbide consisting of a binder phase of 4 to 35% by weight of at least one metal selected from the group consisting of cobalt and nickel; 1 to 50 ppm by weight of impurities; and a hard dispersed phase composed of 0.1 to 40% by weight of at least one compound and balance tungsten carbide; said at least one compound being selected from the group consisting of carbides of metals in Groups IV_A, V_A and VI_A of the Periodic Table, nitrides of metals in Groups IV_A and V_A of the Periodic Table and solid solution of at least two of said carbides and nitrides, said hard dispersed phase having an average crystal grain size of 0.2 to 1.0 μm, the impurities having a crystal grain size of no larger than 10 μm, said binder phase having an average crystal grain size of 5 to 400 μm.

5,068,150

COPPER POWDER FOR ELECTROCONDUCTIVE PAINTS AND ELECTROCONDUCTIVE PAINT COMPOSITIONS

Yoshinobu Nakamura; Kanetaro Sannohe; Yoshio Sohama; Toru Iwasaki, and Sumiko Yamano, all of Takehara, Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,669

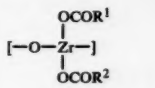
Claims priority, application Japan, Feb. 1, 1988, 63-21630; Feb. 8, 1988, 63-27235

Int. Cl.[5] B32B *5/16;* H01B *1/06*

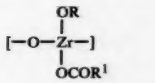
U.S. Cl. 428—407 4 Claims

1. A copper powder for electroconductive paints wherein the surfaces of the particles of copper powder are coated with a mixture of a zirconium acylate polymer and a higher carboxylic acid ester,

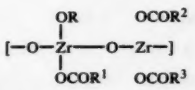
said zirconium acylate polymer comprising at least one of the following repeating units I, II and III:



I



II



III

wherein R, R^1, R^2 and R^3 are the same or different and represent respectively a hydrocarbon group having 1 to 25 carbon atoms,

said higher carboxylic acid ester having the following formula

wherein R^4CO represents an acylate group of a saturated or unsaturated fatty acid having 8 to 24 carbon atoms and R^5O represents an easily hydrolyzable alkoxy group having 1 to 15 carbon atoms,

the mixing ratio of the zirconium acylate polymer and the higher carboxylic acid ester being 10 to 90% by weight of said zirconium acylate polymer to 90 to 10% by weight of said higher carboxylic acid ester, and

the amount of the mixture of the zirconium acylate polymer and the higher carboxylic acid ester to be applied on the surfaces of the particles of copper powder ranging from 0.05 to 10% by weight.

5,068,151

GOLF BALL

Yoshinobu Nakamura, Nishinomiya City, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Feb. 2, 1990, Ser. No. 474,330

Claims priority, application Japan, Feb. 6, 1989, 1-26866

Int. Cl.[5] B32B *27/28;* **A63B** *37/12;* **C08L** *33/02;* **C08F** *220/06*

U.S. Cl. 428—407 **9 Claims**

1. A golf ball comprising a core and a cover covering said core, wherein said cover is a lithium neutralized ionomer resin which is a copolymer of 10 to 20% by weight of an alpha, beta-unsaturated carboxylic acid and the rest of ethylene, of which 20 to 70 mol % of carboxyl groups are neutralized with lithium ion, and said ionomer resin has a melt index of 0.8 to 3.0 and a shore D hardness of 60 to 80.

5,068,152

MAGNETIC RECORDING MEDIUM

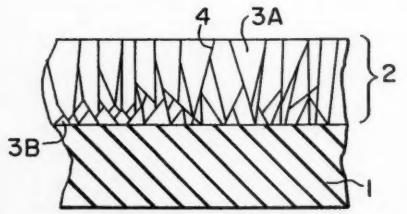
Tsuyoshi Maro; Osamu Kitakami, and Hideo Fujiwara, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Nov. 22, 1988, Ser. No. 274,844

Claims priority, application Japan, Nov. 26, 1987, 62-298371; Apr. 28, 1988, 63-107302; Oct. 28, 1988, 63-272310

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—408 **19 Claims**



1. A magnetic recording medium, which comprises a non-magnetic substrate and a magnetic layer comprised of a ferromagnetic material grown substantially perpendicular on said substrate having a face-centered cubic structure and at least one of carbon, silicon, a hydrocarbon compound and an organosilicon compound, provided on said non-magnetic substrate.

5,068,153

MULTI-COMPONENT COATING COMPOSITION COMPRISING AN ANHYDRIDE CONTAINING POLYMER, A GLYCIDYL COMPONENT AND A PHOSPHONIUM CATALYST

Robert Barsotti, Franklinville, N.J., and Lester S. Cohen, Broomall, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 212,298, Jun. 27, 1988, Pat. No. 4,906,677. This application Oct. 11, 1989, Ser. No. 419,846

Int. Cl.[5] C08K *5/01, 5/10;* **C08L** *63/02*

U.S. Cl. 428—413 **15 Claims**

1. A substrate coated with a layer of a waterborne basecoat and a clearcoat, which basecoat and clearcoat are cured at elevated temperatures, the clearcoat comprising 20–10% by weight of a reactive binder component and 80–20% by weight of an organic liquid carrier; wherein the binder consists essentially of about

(a) 25–90% by weight, based on the weight of the binder, of an anhydride acrylic polymer having at least two reactive anhydride groups that consists of polymerized monomers of an ethylenically unstaturated anhydride or an ethylenically unsaturated dicarboxylic acid and polymerized monomers selected from the group consisting of alkyl methacrylate, alkyl acrylate and any mixtures thereof, wherein the alkyl groups have 1–8 carbon atoms and the polymer has a weight average molecular weight of about 2,000–50,000;

(b) 5–50% by weight, base don the weight of the binder, of a glycidyl component having at least two reactive glycidyl groups; and

(c) about 0.1–7% by weight, based on the weight of the binder, of a catalyst which is a phosphonium catalyst or a blend of phosphonium catalyst and tertiary amine which may or may not contain hydroxyl groups.

5,068,154

BORON NITRIDE/SILICON-CONTAINING CERAMIC MATERIALS

Gerard Mignani, Lyons, and Jean-Jacques Lebrun, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 12, 1988, Ser. No. 243,827

Claims priority, application France, Sep. 11, 1987, 87 12588

Int. Cl.[5] B32B *33/00*

U.S. Cl. 428—446 **12 Claims**

1. A ceramic material which comprises a compatible with silicon ceramic compounds which comprises a boron nitride matrix and a silicon atoms, the majority of said silicon atoms being distributed throughout an external layer of said ceramic material and said ceramic material containing amounts of B_2O_3 and carbon which are not detrimental to the quality of said ceramic material.

5,068,155

OPAQUE, LAMINATED AND STRETCHED PRODUCTS, AND METHOD FOR MAKING THEM

Kazuhiro Yamada, and Tadao Ishibashi, both of Ichihara, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Aug. 15, 1990, Ser. No. 567,730

Claims priority, application Japan, Aug. 29, 1989, 1-222456

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—515 **6 Claims**

1. An opaque laminated and stretched heat-sealable product comprising a stretched first layer of crystalline polypropylene resin blended with a cyclopentadiene-derived petroleum resin having a softening point of 160° C. or higher, as measured by the ring-and-ball method, in an amount of 3 to 30% by weight based on the total weight of both resins; said first layer is laminated on at least one side with a second layer obtained from a crystalline propylene copolymer having a crystalline melting point at least 10° C. lower than that of said crystalline

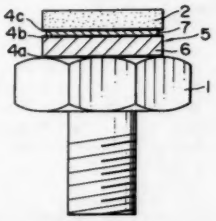
polypropylene resin, wherein said laminated and stretched product has a total light transmittance of 50% or less.

5,068,156

SEMICONDUCTOR PACKAGE

Toshikazu Ogata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,092
Claims priority, application Japan, Feb. 19, 1990, 2-36189
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—620 10 Claims



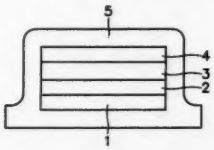
1. A semiconductor package comprising:
a ceramic substrate having a first coefficient of thermal expansion for supporting thereon a semiconductor element;
a heat dissipating member having a second coefficient of thermal expansion;
a first member having a third coefficient of thermal expansion intermediate the first and second coefficients of thermal expansion brazed to said heat dissipating member and disposed intermediate of said ceramic substrate and said heat dissipating member for reducing the thermal stress generated in said ceramic substrate during brazing of said ceramic substrate and said heat dissipating member; and
a flexible metal foil brazed to said first member and to said ceramic substrate for preventing said ceramic substrate from being deformed by thermal stress.

5,068,157

ELECTROLUMINESCENT ELEMENT

Song Won, Susung-Ku, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea

Filed Oct. 26, 1989, Ser. No. 427,193
Claims priority, application Rep. of Korea, Oct. 26, 1988, 88-13985[U]
Int. Cl.[5] H01J *1/62;* B05D *5/06*
U.S. Cl. 428—690 7 Claims



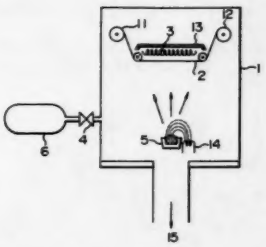
1. An electroluminescent element capable of high luminescence under low voltage comprising first and second electrodes with insulating and phosphor layers therebetween; said element comprising a first electrode, an insulating layer comprising cyanoethyl resin, a phosphor layer deposited upon the insulating layer, a second electrode on the phosphor layer and an enclosing film sealing said layers, said phosphor layer comprising ZnS phosphor to which has been added a solution of an organic insulating material, barium titanate and indium oxide.

5,068,158

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PREPARING THE SAME

Masaaki Futamoto, Kanagawa; Yukio Honda, Fuchu, and Kazuetsu Yoshida, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 12,996, Feb. 10, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 281,965
Claims priority, application Japan, Mar. 7, 1986, 61-48257
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—694 12 Claims



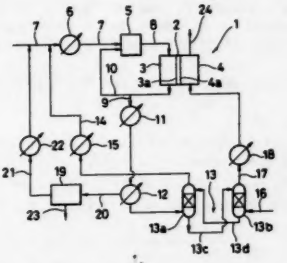
1. A magnetic recording medium which comprises a non-magnetic substrate and a film of a Co-based alloy having predominate magnetic anisotropy aligned perpendicular to a surface of said film and being formed on said substrate by vacuum evaporation in a nitriding atmosphere while adjusting the pressure of the nitriding gas to a range of 3×10^{-7} t 4×10^{-5} Torr, said film of Co-based alloy containing 0.01 to 1 atomic percent of nitrogen, wherein said film of Co-based alloy comprises columnar crystal grains of said Co-based alloy.

5,068,159

ELECTRIC POWER PRODUCING SYSTEM USING MOLTEN CARBONATE TYPE FUEL CELL

Noboru Kinoshita, Chiba, Japan, assignor to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,134
Claims priority, application Japan, Dec. 24, 1988, 63-324797
Int. Cl.[5] H01M *8/06, 8/14*
U.S. Cl. 429—16 25 Claims



1. A method of producing electric power using a molten carbonate type fuel cell wherein an anode gas is fed into an anode chamber of the fuel cell and a cathode gas is fed into a cathode chamber thereof, which comprises the steps of:
(A) separating carbon dioxide gas from an anode exhaust gas expelled from the anode chamber;
(B) recirculating the anode exhaust gas from which carbon dioxide gas has been separated in step (A), into the anode chamber as the anode gas; and
(C) feeding the carbon dioxide gas separated from the anode exhaust gas in step (A), into the cathode chamber as the cathode gas;

wherein a fuel gas such as methane is reformed with steam in a reformer so as to obtain the anode gas and the anode gas is supplied into the anode of the fuel cell, and the anode exhaust gas from which carbon dioxide has been separated in step (A) is fed into the reformer together with the fuel gas and steam and then recirculated to the anode chamber.

✓

5,068,160

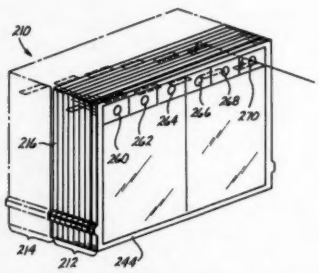
BIPOLAR PLATE BATTERY

Thomas J. Clough, Santa Monica, and Richard J. Moulton, Lafayette, both of Calif., assignors to Ensci, Inc., Santa Monica, Calif.

Filed Apr. 17, 1990, Ser. No. 510,452

Int. Cl.[5] H01M *10/18*

U.S. Cl. 429—72 **29 Claims**



1. In an assembled battery including a plurality of bipolar cells, the improvement which comprises a plurality of conduit means for introducing electrolyte into said bipolar cells, each of said conduit means positioned to be in fluid communication with a different single bipolar cell of said plurality of bipolar cells and to cross over at least one other bipolar cell adjacent said single bipolar cell and acting to introduce electrolyte into said single bipolar cell.

✓

5,068,161

CATALYST MATERIAL

Lindsey Keck, Boyertown, Pa.; Jeffrey Buchanan, Eastleigh, and Graham A. Hards, Wallingford, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Filed Mar. 30, 1990, Ser. No. 501,947

Int. Cl.[5] H01M *4/88*

U.S. Cl. 429—44 **22 Claims**

1. An electrocatalytic material comprising an alloy of platinum supported on a conductive carbon support, the platinum loading being in the range of 20 to 60 wt %, and the ECA of the alloy being greater than 35 m^2/g Pt.

✓

5,068,162

RESERVE ACTIVATED ELECTROCHEMICAL CELL

Milind V. Kulkarni, Melrose Park, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 17, 1989, Ser. No. 339,444

Int. Cl.[5] H01M *6/30*

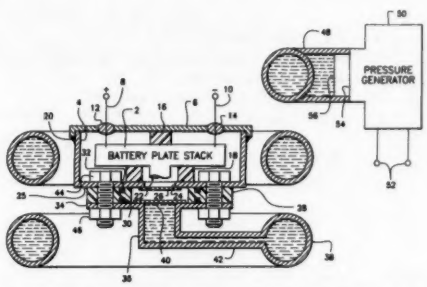
U.S. Cl. 429—116 **10 Claims**

1. A reserve activated electrochemical cell comprising

a cell reactive fluid storage tubular spiral,

an electrochemical cell plate container means for storing cell plates and located within the turns of said tubular spiral and adjacent to a first end of said tubular spiral,

a rupturable means for providing a fluid-tight separation of said spiral and said container means and



an intermediate spacer means for selectively attaching said first end to said container means while providing a fluid channel including said rupturable means.

5,068,163

RADIATION-SENSITIVE POSITIVE WORKING COMPOSITION AND COPYING MATERIAL

Andreas Elsaesser, Idstein; Werner Frass, Wiesbaden, and Dieter Mohr, Budenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,688

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820699

Int. Cl.[5] G03C *1/52, 1/492*

U.S. Cl. 430—192 **17 Claims**

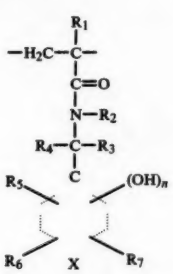
1. A positive-working radiation-sensitive mixture which comprises

a) a water-insoluble polymeric binder which is soluble in aqueous alkaline solution, in an amount sufficient to form a solid layer, and

b) a radiation-sensitive compound or combination of compounds selected from the group consisting of a 1,2-quinone diazide and a combination of

1) a compound forming strong acid when exposed to actinic radiation and

2) a compound containing at least one cleavable C—O—C bond, in an amount sufficient to increase the solubility of said solid layer on exposure to actinic radiation, wherein said binder is a polymer comprising units of the general formula I



I

where

R_1 denotes a hydrogen or halogen atom, or a cyanide or an alkyl group,

R_2, R_3, R_4 are identical or different and denote hydrogen, or alkyl or aryl groups,

R_5, R_6 and optionally R_7 are identical or different and enote hydrogen or halogen atoms, or alkyl, aryl or alkoxy groups,

X denotes the atoms necessary to complete a mononuclear or polynuclear carbocyclic aromatic ring system, and

n is 1, 2 or 3.

5,068,164

DEVELOPER WITH HYDROXYARYL FATTY ACID FOR MAKING LITHOGRAPHIC PRINTING PLATE

Toshiro Kondo, and Hidetoshi Miura, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 27, 1990, Ser. No. 499,660

Claims priority, application Japan, Mar. 29, 1989, 1-77851

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—204 7 Claims

1. A method for making a lithographic printing plate which comprises exposing imagewise a light sensitive material comprising a support, a silver halide emulsion layer and a physical development nuclei layer and then developing the light sensitive material with an aqueous alkaline developing composition containing a hydroxyaryl fatty acid in the presence of a silver halide solvent to transfer silver complexes formed from unexposed silver halide to the physical development nuclei layer to form a silver transfer image.

5,068,165

LITHOGRAPHIC ALUMINUM OFFSET PRINTING PLATE MADE ACCORDING TO THE DTR-PROCESS

Paul J. Coppens, Turnhout; Ludovicus H. Vervloet, Kessel; Luc H. Leenders, Herentals, and Ronald Schuerwegen, Schelle, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Jul. 16, 1990, Ser. No. 552,945

Claims priority, application European Pat. Off., Jul. 25, 1989, 89201960.5

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—204 29 Claims

1. Method for making lithographic aluminium offset printing plates according to the DTR-process comprising the steps of:

(a) photo-exposing a photosensitive monosheet layer assemblage comprising a hydrophilic grained and anodized aluminium foil, a water-swellable intermediate layer coated at a ratio of 0.01 to 2.0 g/m2 and comprising for at least 70% of its total weight at least one non-proteinic hydrophilic film-forming polymer, and at least one silver halide emulsion layer,

(b) applying an aqueous alkaline solution to the photo-exposed silver halide emulsion layer in the presence of at least one developing agent and at least one silver halide solvent, thus reducing the photo-exposed silver halide and allowing the unreduced silver halide or complexes formed thereof to diffuse from the unexposed areas of the silver halide emulsion layer to said hydrophilic grained and anodized aluminium foil to produce from the unreduced silver halide or complexes formed thereof a silver image on said hydrophilic grained and anodized aluminium foil, and

(c) separating said at least one emulsion layer and said water-swellable intermediate layer from the imaged hydrophilic grained and anodized aluminium foil.

5,068,166

METHOD OF DISPLAYING A PHOTOGRAG312P1HIC EMULSION

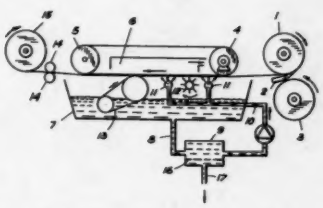
Henriette S. Boogaards-Könecker, Hageland 22, 4640 RZ Ossendrecht, Netherlands

Division of Ser. No. 347,250, May 3, 1989, Pat. No. 4,931,371, which is a continuation of Ser. No. 129,968, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 828,180, Feb. 11, 1986, abandoned. This application Nov. 16, 1989, Ser. No. 437,541

Claims priority, application European Pat. Off., Aug. 14, 1985, 85201310

Int. Cl.[5] G03C *11/12*

U.S. Cl. 430—256 1 Claim



1. Method of using a photographic emulsion of a photographic print comprising:

(a) providing a photographic emulsion separated from a positive photographic print having a paper backing, said emulsion bearing an image and having a thickness of less than 50 microns and having no paper residues adhering thereto;

(b) displaying said photographic emulsion as a self-supporting sheet.

5,068,167

HIGH CONTRAST PHOTOGRAPHIC MATERIALS

Kevin P. Hall, High Wych, Great Britain, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 29, 1988, Ser. No. 174,725

Claims priority, application United Kingdom, Apr. 2, 1987, 8707841

Int. Cl.[5] G03C *1/34*

U.S. Cl. 430—264 11 Claims

1. A photographic element free of latent image and capable of producing a high contrast silver image comprising a washed high contrast silver halide photographic emulsion on a clear photographic base, said emulsion containing a hydrazine, said emulsion also comprising at least 0.001 mole per mole of silver halide of a water-soluble bromide and/or water-soluble chloride.

5,068,168

STYRENE/MALEATES TERPOLYMERS

Kang I. Lee, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1990, Ser. No. 630,657

Int. Cl.[5] G03C *1/76;* C08F *218/16*

U.S. Cl. 430—270 6 Claims

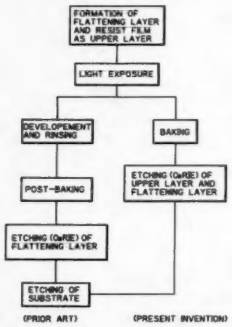
1. A terpolymer of styrene, mono-isobutyl maleate and mono-2-(n-butoxy)ethyl maleate wherein the ratio of styrene units to maleate units is in the range of about 1:1 to about 1.6:1 and wherein the ratio of mono-isobutyl maleate units to mono-2-(n-butoxy)ethyl maleate units is in the range of about 3:2 to about 1:3 and wherein the weight average molecular weight is greater than about 100,000 daltons.

5,068,169

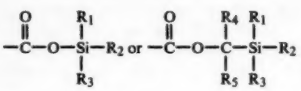
PROCESS FOR PRODUCTION OF SEMICONDUCTOR DEVICE

Satoshi Takechi, Machida; Yuko Nakamura, Kawasaki, and Yukari Mihara, Yokohami, all of Japan, assignors to Fujitsu Limited, Kawqasaki, Japan

Filed Oct. 26, 1989, Ser. No. 426,755
Claims priority, application Japan, Oct. 26, 1988, 63-268298
Int. Cl.[5] G03F *7/36*
U.S. Cl. 430—313 **4 Claims**



1. A process for the production of a semiconductor device, which comprises forming a film of a resist composed of a substance generating an acid catalyst by being irradiated with radiation and a polymer having an Si-containing group that can be eliminated by the acid catalyst, selectively irradiating the resist film with radiation and patterning the irradiated resist film by one of oxygen reactive ion etching, ECR etching and reactive ion beam etching, wherein the resist comprises a polymer having on the side chain a structure represented by the following structural formula (2):

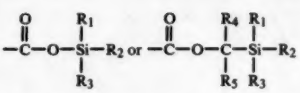


(2)

wherein R_1, R_2 and R_3 each represent an alkyl group or a phenyl group, and R_4 and R_5 each represent a hydrogen atom, an alkyl group, a phenyl group or

and a substance capable of generating a protonic acid under irradiation with radiations.

3. A process for the production of a semiconductor device according to the two-layer resist method, which comprises forming a planarizing layer composed of an organic material on a substrate, forming a film of a polymer on the planarizing layer and forming a pattern, wherein light exposure is carried out by using a resist composed of a substance generating an acid catalyst by being irradiated with radiation and a polymer having an Si-containing group that can be eliminated by the acid catalyst, as said polymer, and the top layer and the bottom layer are simultaneously patterned by one of oxygen reactive ion etching, ECR etching and reactive ion beam etching, wherein the resist comprises a polymer having on the side chain a structure represented by the following structural formula (2):



(2)

wherein R_1, R_2 and R_3 each represent an alkyl group or a phenyl group, and R_4 and R_5 each represent a hydrogen atom, an alkyl group, a phenyl group or

and a substance capable of generating a protonic acid under irradiation with radiations.

5,068,170

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Akira Abe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 9, 1990, Ser. No. 564,518
Claims priority, application Japan, Aug. 11, 1989, 1-206990
Int. Cl.[5] G03C *7/31, 7/42*
U.S. Cl. 430—393 **13 Claims**

1. A method for processing an imagewise exposed silver halide color photographic material for photography which comprises the steps of:

color-developing a silver halide color photographic material which comprises a photographic emulsion layer containing a silver bromoiodide, a silver chloroiodide or silver bromochloroiodide having an iodide content of from 0.1 to 30 mol%, with a color developing solution,

processing said developed silver halide color photographic material with a bleaching solution, and then

processing said bleached silver halide color photographic material with a processing solution having a fixing ability, wherein the replenishment rate of said color developing solution is 600 ml or less per m^2 of the photographic material; said bleaching solution contains a bleaching agent having an oxidation reduction potential of 150 mV or more and further an organic acid having a pKa of from 2 to 5.0, provided that an aminopolycarboxylic acid or a salt thereof and an iron complex salt of the aminopolycarboxylic acid are excluded, in an amount of 1.2 mol or more per liter of the bleaching solution; said bleaching solution has a pH value of 3.0 to 5.0; and the total time for processing said photographic material with the processing solution having a fixing ability is in the range of 30 seconds to 2 minutes.

5,068,171

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A TWO EQUIVALENT 5-PYRAZOLONE MAGENTA COUPLER AND COLOR PHOTOGRAPH CONTAINING THE SAME

Masakazu Morigaki, and Nobuo Seto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

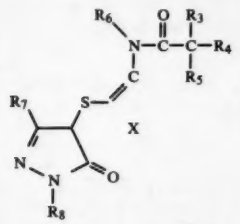
Filed Jul. 13, 1989, Ser. No. 379,253
Claims priority, application Japan, Jul. 16, 1988, 63-177896
Int. Cl.[5] G03C *7/384, 1/34*
U.S. Cl. 430—9 **9 Claims**

1. A silver halide color photographic light-sensitive material comprising a support and at least one silver halide emulsion layer on the support, wherein said material contains

(i) at least one 5-pyrazolone coupler is selected from the group consisting of couplers represented by formulas (II) or (III):

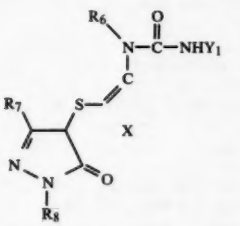
wherein L_1 and L_2 are the same or different groups and

each represents independently a substituted or an unsubstituted methylene or ethylene group; m and n are each 0 or 1; Y represents R_1 or ZR_2; R_1 represents a substituted or an unsubstituted aryl or heterocyclic group or a secondary or a tertiary alkyl group represented by



(II)

R_3 and R_4 each represents independently a halogen atom, R_2 or Z_1R_b; Z_1 represents an oxygen atom, a sulfur atom or $—NR_c$; R_2 represents a substituted or an unsubstituted alkyl, aryl or heterocyclic group; R_5 represents a hydrogen atom, a halogen atom, a substituted or an unsubstituted alkyl, aryl or heterocyclic group or Z_1R_b; R_6 and R_c each represents independently a hydrogen atom or these groups set forth in the definition of R_2 above; R_b is a substituted or an unsubstituted alkyl, aryl or hetercyclic group; R_3 may be combined together with R_4 and/or R_5 to form one or two carbon atom rings or heterocyclic rings and these rings may be optionally substituted; and X is an atomic group composed of atoms selected from the group consisting of carbon, oxygen and sulfur atoms to form an unsaturated five-membered to seven-membered ring which may be optionally substituted or condensed with another ring; R_7 represents an aniline group, an acylamino group, an ureido group, a carbamoyl group, an alkoxy group, an aryloxycarbonyl group, an alkoxycarbonyl group or a N-hetercyclic group, and R_8 represents a substituted or an unsubstituted aryl group;

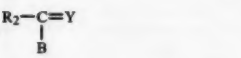


(III)

wherein Y_1 represents a substituted or an unsubstituted alkyl, aryl or heterocyclic group, and R_6, R_7, R_8 and X are as defined above; and

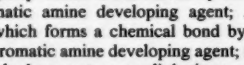
(ii) at least one compound selected from the group consisting of compounds represented by formulas (AI), (AII) and (AIII):

(AI)



(AII)

wherein R_1 and R_2 each represents an aliphatic group, an aromatic group or a heterocyclic ring; X represents a group which is eliminated by the reaction with an aromatic amine developing agent; A represents a group which forms a chemical bond by the reaction with the aromatic amine developing agent; n is 0 or 1; B represents a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an acyl group or a sulfonyl group; Y represents a group which accelerates the addition of the aromatic amine developing agent to the compound having the formula (AII); and R_1 and X, or Y and R_2 or B may be combined together to form a ring structure,



(AIII)

wherein R represents an aliphatic group, an aromatic group or a heterocyclic group; and Z represents a nucleophilic group or a group which is decomposed in the photographic material to release a nucleophilic group.

9. A color photograph obtained from a silver halide color photographic light sensitive material comprising a support having thereon at least one 5-pyrazolone coupler as defined in claim **1** and at least one silver halide emulsion layer, wherein the photograph comprises (i) a magenta dye formed by an oxidation reaction of said coupler with a color developing agent, and (ii) at least one compound selected from the group consisting of compounds represented by formula (AI), (AII) and (AIII) defined in claim **1**.

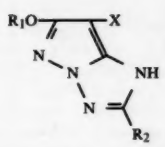
5,068,172

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Nobuo Seto; Masakazu Morigaki, and Hideaki Naruse, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

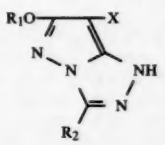
Filed Feb. 20, 1990, Ser. No. 482,070
Claims priority, application Japan, Feb. 20, 1989, 1-38304
Int. Cl.[5] G03C 7/32
U.S. Cl. 430—551 **11 Claims**

1. A silver halide color photographic material wherein at least one coupler selected from the group consisting of the compounds represented by the following general formulae (I) and (II), at least one compound represented by the following general formula (III) and at least one compound represented by the following general formula (IV) are included in the same layer,



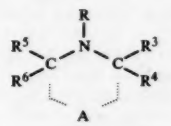
Formula (I)

and



Formula (II)

wherein R_1 represents an 2-alkoxyphenyl group and R_2 represents a hydrogen atom or a substituent group, and X represents a hydrogen atom or a group eliminated by a coupling reaction,

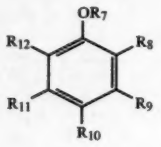


Formula (III)

wherein R represents an acyl group, an alkyloxycarbonyl group, aryloxycarbonyl group, alkylsulfinyl group, arylsulfi-

nyl group, alkylsulfonyl group, carbamoyl group, sulfamoyl group or arylsulfonyl group; R^3, R^4, R^5 and R^6 may be identical or different and respectively represent alkyl groups, A represents a group of non-metallic atoms necessary to form a 5-membered, 6-membered or 7-membered ring, R^3 and R^4, R^5 and R^6, R and R^3, and R^3 and A may respectively link together to form a 5-membered or 6-membered ring, and A, R, or A and R may represent a divalent group to form a dimer or a trimer of the compound represented by formula (III),

Formula (IV)



wherein R_7 represents an alkyl group, alkenyl group, aryl group, heterocyclic group or

wherein R_{13}, R_{14} and R_{15} may be identical or different and respectively represent an alkyl group, alkenyl group, aryl group, alkoxy group, alkenoxy group or aryloxy group, R_8, R_9, R_{10}, R_{11} and R_{12} may be identical or different and respectively represent a hydrogen atom, alkyl group, alkenyl group, aryl group, acylamino group, alkylamino group, alkylthio group, arylthio group, halogen atom or —O—R_7', wherein R_7' has the same meaning as R_7, R_7 and R_8 may link together to form a 5-membered ring, 6-membered ring or spiro ring and R_8 and R_9 or R_9 and R_{10} may link together to form a 5-membered ring, 6-membered ring or spiro ring.

5,068,173

PHOTOSENSITIVE SILVER HALIDE EMULSIONS CONTAINING PARALLEL MULTIPLE TWIN SILVER HALIDE GRAINS AND PHOTOGRAPHIC MATERIALS CONTAINING THE SAME

Hiroshi Takehara, and Hideo Ikeda, both of Kanagawa, Japan, assignors to Fumi Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 8, 1989, Ser. No. 307,711

Claims priority, application Japan, Feb. 8, 1988, 63-26977

Int. Cl.[5] G03C *1/035*

U.S. Cl. 430—567 **12 Claims**

1. A photosensitive silver halide emulsion comprising photosensitive silver halide grains dispersed in a binder, wherein at least 70% of the total projected area of silver halide grains comprises tabular grains having a diameter of at least 0.15 μm and wherein said grains comprise a core, an internal high iodide phase non-uniformly deposited on said core, and a phase which has a lower iodide content than the high iodide phase as a surface layer, wherein the iodide content of the core is lower than that of the high iodide pohase and is from 0 to 12 mol %, the internal high iodide phase is deposited in localized areas, is a silver halide solid solution and contains from 10 to 40 mol % iodide, and the high iodide phase surface layer has an iodide content of from 0 to 12 mol %, wherein the mean aspect ratio of said tabular grains is not more than 8.0, wherein grains, in which the value of the ratio (b/a) of the longest distance (a) between two or more parallel twinning planes in the tabular grain and the grain thickness (b) is at least 5, comprise at least 50% (in erms of numbers of grains) of all of said tabular grains, and wherein at least 50% (in erms of teh numbers of grains) of said tabular grains are grains in which the number of dislocations per grain is at least 10.

5,068,174

T-CELL LYMPHOTROPHIC VIRUS PROTEIN AND ASSAY

Myron E. Essex, Sharon; Jonathan S. Allan, Westwood, and Tun-Hou Lee, Newton, all of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 795,997, Nov. 7, 1985. This application Oct. 25, 1988, Ser. No. 250,309

Int. Cl.[5] G01N *33/569*

U.S. Cl. 435—5 **8 Claims**

1. A method of assaying a biological specimen for the presence of HIV antibodies indicative of HIV infection, comprising the steps of:

(a) incubating a biological specimen in which the presence of HIV antibodies is to be detected with a composition comprising a marker consisting essentially of i) p27 (a protein encoded by the open reading frame 3' to the env gene of HIV), or ii) a fragment of p27 having an antigenic determinant that reacts with anti-p27 antibody, said incubating being for a sufficient time and under conditions to allow said p27 polypeptide or fragment to form an immunocomplex with antibody present in said specimen; and

(b) then determining whether an immunocomplex is formed between said marker and antibody in said specimen, the formation of an immunocomplex being indicative of the presence of HIV infection.

5,068,175

METHOD OF DETECTING RAS ONCOGENE RELATED MALIGNANCIES

Nagindra Prashad, Houston, Tex., assignor to Board of Regents, The University of Texas Sysem, Austin, Tex.

Filed May 26, 1989, Ser. No. 358,449

Int. Cl.[5] C12Q *1/68;* **C07H** *15/12;* **C12N** *15/00;* **G01N** *33/48*

U.S. Cl. 435—6 **16 Claims**

1. A method for detecting ras oncogene related malignancy in a human subject, comprising the steps of:

a) collecting a test serum or plasma sample from a human subject;

b) providing a control serum or plasma sample from a tumor free donor;

c) incubating each of the control and test samples with a DNA having a sequence consisting essentially of a human ras oncogene promoter under conditions effective to promote specific binding interactions between protein factors in the samples and the DNA sequence;

d) separating in each of the control and test samples a protein factor-DNA complex from free DNA; and

e) comparing the amounts of protein factor-DNA complex of both the test and control samples, wherein if the test sample features an amount of about 10-fold or higher of a protein factor-DNA complex than the control sample, there is an indication of a ras oncogene related malignancy.

5,068,176

METHOD FOR THE SIMULTANEOUS DETERMINATION OF DNA SEQUENCE VARIATIONS AT A LARGE NUMBER OF SITES, AND A KIT SUITABLE THEREFOR

Jan Vijg, and Andreas G. Uitterlinden, both of Rotterdam, Netherlands, assignors to Nederlandse Organisatie voor toegepastnatuurwetenschappelijk onderzoek TNO, Gravenhage, Netherlands

Filed May 1, 1989, Ser. No. 345,887

Claims priority, application Netherlands, May 2, 1988, 8801147

Int. Cl.[5] C12Q *1/68;* **C07H** *15/12;* **G01N** *33/566;* **C12N** *15/00*

U.S. Cl. 435—6 **9 Claims**

1. A method of detecting genetic variation by fragmenting double-stranded DNA by means of one or more restriction enzymes, separating the resulting fragments by electrophore-

sis, transferring the resulting separation pattern to a membrane filter, hybridizing thereon under DNA-denaturing conditions with a labelled DNA or RNA probe, and visualizing the label, characterized in that the electrophoretic separation of the DNA fragments generated is carried out in two dimensions on the basis of two independent criteria, the fragments being separated in one dimension on the basis of their length and being separated in the other dimension on the basis of their base pair sequence, and in that the probe used in the hybridization analysis is a labelled DNA or RNA molecule containing one or more cores of minisatellite sequences or other GC-rich repeats.

5,068,177

ANTI-IDIOTYPE ANTIBODIES INDUCED BY SYNTHETIC POLYPEPTIDES

Dennis A. Carson, Del Mar; Sherman Fong, and Pojen P. Chen, both of San Diego, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 566,172, Dec. 28, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 762,698

Int. Cl.[5] G01N *33/53, 33/543;* **C07K** *15/14, 7/00*

U.S. Cl. 435—7.92 **35 Claims**

1. A synthetic polypeptide having an amino acid residue sequence containing about 6 to about 40 amino acid residues immunologically corresponding substantially to a primary amino acid residue sequence of an idiotypic determinant of an immunoglobulin said idiotype determinant including an amino acid residue sequence, taken from left to right and in the direction from amino-terminus to carboxy-terminus, represented by a formula that is a member of the group consisting of

YGASSRATGIPDR,
KYSGGTFSGYTISC,
EWKGOVNVNPFDY, and
EYGFDTSDYYYYY.

5,068,178

METHOD OF ENHANCING DIRECT IMMUNOFLUORESCENCE STAINING OF CELLS

Robert C. Nowinski, Bothell, Wash., assignor to Genetic Systems Corporation, Redmond, Wash.

Continuation of Ser. No. 282,911, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 934,165, Nov. 21, 1986, abandoned, which is a continuation of Ser. No. 629,094, Jul. 9, 1984, abandoned. This application Apr. 27, 1990, Ser. No. 517,953

Int. Cl.[5] G01N *33/577*

U.S. Cl. 435—7.2 **16 Claims**

1. A method of identifying and enumerating a specific cell type in a heterogenous population of cells which enhances the specific staining of desired cells, comprising:

(a) contacting a sample from said heterogeneous population of cells with a primary labeled antibody which recognizes and binds to a desired cell surface antigen, the presence of said antigen being characteristic of said specific cell type;

(b) washing said sample to remove unbound labeled primary antibody;

(c) contacting said sample with an unlabeled cross-linking agent which recognizes and binds to said primary antibody within the plane of the cellular membrane;

(d) detecting the cells which have been lebeled by binding to said primary antibody; and

(e) relating the detection of step (d) to the identification and enumeration of the specific cell type;

wherein steps (a), (b) and (c) are carried out at the temperature of an ice bath and there is no incubation at 37° C. between steps (c) and (d).

5,068,179

PROCESS FOR THE DETERMINATION OF A COMPONENT OF AN IMMUNE REACTION IN A PLASMA SAMPLE

Rolf Deeg, Bernried; Rainer Wehner, Gauting; Johann Mattersberger, Munich, and Udo Becker, Marburg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 900,827, Aug. 27, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 262,166

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530942

Int. Cl.[5] G01N *33/53, 33/543*

U.S. Cl. 435—7.92 **10 Claims**

1. In a method for carrying out a heterogeneous immunoassay for a component of a plasma sample at a temperature of from 15°–40° C. in an incubation medium, the improvement comprising adding an amount of a plasminogen activator to said sample sufficient to eliminate interference by fibrinogen with said component to be determined.

5,068,180

SUBSTRATES FOR BETA-GALACTOSIDASE

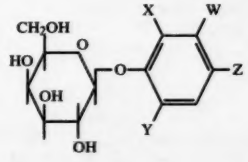
Deng R. Hwang, Tarrytown, N.Y., and Mary Ellen A. Scott, Ringwood, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 52,328, May 21, 1987, abandoned. This application Nov. 8, 1989, Ser. No. 433,426

Int. Cl.[5] G01N *33/53;* **G07G** *3/00;* **C07H** *15/00;* **C12Q** *1/54*

U.S. Cl. 435—7.92 **18 Claims**

1. A substrate for β-galactosidase comprising a compound of the formula



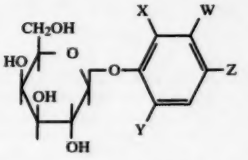
wherein X is halogen; Y is halogen, lower alkyl or hydrogen; W is hydrogen or lower alkyl; and z is nitro.

18. A method for determining the presence of an analyte in a test sample by enzyme immunoassay when said enzyme reagent is β-galactosidase comprising the steps of

(a) providing a test sample suspected of containing the analyte to be determined;

(b) reacting said test sample with a first reagent comprising an antibody to said analyte, a substrate, and a second reagent comprising an enzyme conjugate reactive either with the antibody or the analyte and capable of generating a detectable response in the presence of said substrate; and

(c) determining the presence of said analyte as a result of the detectable response generated by the interaction of said enzyme and said substrate; wherein the improvement comprises using as said substrate of step (b) a compound of the formula



wherein X is halogen; Y is halogen, lower alkyl or hydrogen; W is hydrogen or lower alkyl; and Z is nitro.

5,068,181

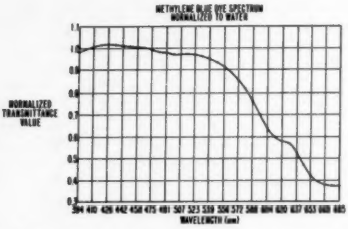
METHOD OF MONITORING REAGENT DELIVERY IN A SCANNING SPECTROPHOTOMETER

Richard C. Driscoll, Raleigh, N.C., assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 1, 1989, Ser. No. 443,953

Int. Cl.[5] G01N *21/77*; N01N *21/78*

U.S. Cl. 435—13 **17 Claims**



17. A method for measuring the concentration of a reagent in a reaction mixture comprising the steps of:

adding rhodamine B to a reagent until the rhodamine B is at given concentration in the reagent;

mixing the reagent with a reaction mixture comprising a biological sample which reacts with the reagent to form a reaction product;

measuring the formation of the reaction product at a first spectral region;

measuring the concentration of rhodamine B in the reaction mixture at a second spectral region in which the rhodamine B fluoresces, the second spectral region being different from the first spectral region; and

determining the concentration of the reagent in the reaction mixture based on the concentration of rhodamine B measured.

5,068,182

SUBSTRATES AND REAGENTS USEFUL IN DETERMINING α-AMYLASE AND A METHOD FOR DETERMINING α-AMYLASE

Axel Schmidt, Munich; Herbert Von Der Eltz, Weilheim, and Elli Rauscher, Munich, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

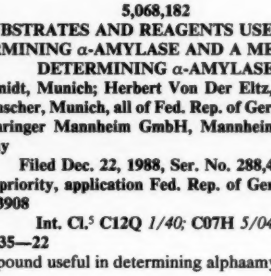
Filed Dec. 22, 1988, Ser. No. 288,471

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743908

Int. Cl.[5] C12Q *1/40*; C07H *5/04*

U.S. Cl. 435—22 **12 Claims**

1. Compound useful in determining alphaamylase and of the formula

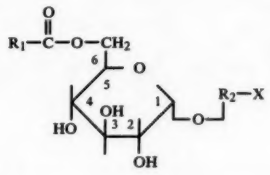


(I)

wherein R_1 is a hydrogen atom, straight chained or branched alkyl of from 1 to 4 carbons or 1-alkoxyalkyl radical, a cycloalkyl or hydrophilically substituted cycloalkyl radical of from 3 to 6 carbons, tetrahydropyranyl, an piperidinyl, N-methyl substituted piperidinyl or N-ethyl substituted piperidinyl, thiophenyl or 1,1-dioxo-tetrahydrothiopyranyl radical, an amino group or an amino group substituted at least once by methyl, ethyl, propyl or isopropyl, R_2 is an oligoglucoside residue with 2,3 or 4 glucose units and X is a hydrogen atom or an optically determinable residue.

10. Reagent useful for the determination of alpha amylase in a sample, comprising:

0.5–2 mmole/liter of a compound of the formula



(I)

wherein R_1 is a hydrogen atom, straight chained alkyl of from 1 to 4 carbons or 1-alkoxyalkyl radical, a cycloalkyl or hydrophilically substituted cycloalkyl, radical of from 3 to 6 carbons, tetrahydropyranyl, piperidinyl, N-methyl substituted piperidinyl or N-ethyl substituted piperidinyl, thiophenyl or 1,1-dioxo-tetrahydrothiopyranyl radical an amino group or an amino group substituted at least once by methyl, ethyl, propyl or isopropyl, R_2 is an oligoglucoside residue with 2,3 or 4 glucose units and X is a hydrogen atom or an optically determinable residue,

30–100 mmole/liter Nacl;

at least one of 20–50 U/liter alpha glucosidase and 0.5–2 U/liter beta glucosidase, and

20–200 mmole/liter of a buffer at a pH of 6–8.

5,068,183

METHOD FOR MEASUREMENT OF α-AMYLASE ACTIVITY

Zensuke Ogawa, 4459-3 Fujisawa, Fujisawa-shi, Kanagawa, Japan, assignor to Kurita Water Industries, Ltd., Tokyo and Zensuke Ogawa, Fujisawa, both of, Japan

Division of Ser. No. 116,617, Nov. 3, 1987. This application Jan. 3, 1991, Ser. No. 637,135

Claims priority, application Japan, Nov. 20, 1986, 61-277702; Feb. 10, 1987, 62-28943

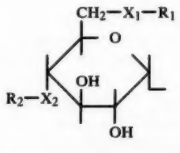
Int. Cl.[5] C12Q *1/40*; C13K *1/00*

U.S. Cl. 435—22 **8 Claims**

1. A method for measurement of α-amylase activity in a sample, comprising contacting a substrate containing a maltooligo saccharide represented by general formula (I) described below with the sample in the presence of glucosidase and measuring a liberated monosaccharide or a derivative represented by B of the general formula (I) and liberated through activity of α-amylase thereby to measure α-amylase activity in the sample:

A - Gn - B (I)

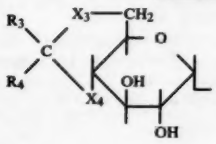
wherein A represents:



(II)

or

-continued



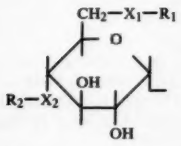
(III)

B represents a monosaccharide or a derivative thereof other than glucose; G represents glucose; and n represents an integer of 3 to 15; in formula (II) or (III), R_1 to R_4 each represents a hydrogen atom, a lower alkyl group or $(CH_2)yCOOM$ (wherein y is 0, 1 or 2 and M represents a hydrogen atom or an alkali metal); and X_1 to X_4 each represents an oxygen atom or a sulfur atom.

5. A method for measurement of α-amylase activity in a sample, comprising contacting a substrate containing a maltooligo saccharide represented by general formula (V) described below with the sample and measuring a liberated inositol or a derivative represented by I of the general formula (V) and liberated by α-amylase activity to determine α-amylase activity in the sample:

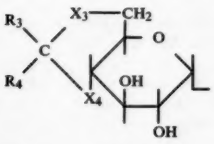
A - Gn - I (V)

wherein A represents:



(II)

or



(III)

I represents inositol or a derivative thereof; G represents glucose; and n represents an integer of 3 to 15; in formula (II) or (III), R_1 to R_4 each represents a hydrogen atom, a lower alkyl group or $(CH_2)yCOOM$ (wherein Y is 0, 1 or 2 and M represents a hydrogen atom or an alkali metal); and X_1 to X_4 each represents an oxygen atom or a sulfur atom.

5,068,184

FLAVOR COMPOSITION AND METHOD

Mark E. Knuth, San Carlos, and Om P. Sahai, San Mateo, both of Calif., assignors to Escagenetics, Inc., San Mateo, Calif.

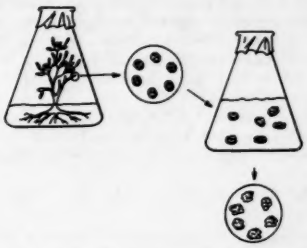
Continuation-in-part of Ser. No. 78,745, Jul. 28, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 221,951

Int. Cl.[5] C12P *1/00;* **C12N** *5/04*

U.S. Cl. 435—41 **7 Claims**

1. A method of producing vanillin and related vanilla flavor components comprising

culturing in a culture medium callus cells which are independent of and unattached to differentiated plant tissue, and which (a) are derived from vanilla plant tissue, (b) are capable of growth in cell culture without forming identifiable differentiated cell structures, and (c) secrete vanillin and related vanilla flavor components into culture medium in which the cells are cultured, and



separating the secreted flavor components from the culture medium.

5,068,185

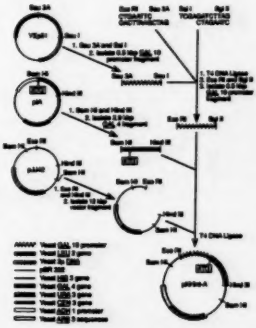
TRAINS OF YEAST FOR THE EXPRESSION OF HETEROLOGOUS GENES

James E. Hopper, Lebanon; Loren D. Schultz, Harleysville; Kathryn J. Hofmann, King of Prussia, and Ronald W. Ellis, Overbrook Hills, all of Pa., assignors to Merck & Co., Inc., N.J.

Filed Jul. 10, 1986, Ser. No. 884,114

Int. Cl.[5] C12P *21/02;* **C12N** *15/00, 1/14, 1/16, 1/18, 15/81, 1/19*

U.S. Cl. 435—69.1 **12 Claims**



7. A method of expressing a desired heterologous protein comprising growing in a nutrient medium a strain of species of the families Saccharomycetaceae or Cryptococcaceae wherein the chromosome is modified by integration of a hybrid gene comprised of a galactose inducible promoter linked to the gene for a positive regulatory protein which serves as the transcriptional activator of galactose-inducible promoters, said strain being the host for a plasmid comprising a yeast galactose-inducible promoter linked to a heterologous gene whose expression is driven by the galactose-inducible promoter.

5,068,186

PROCESS FOR THE ENZYMATIC PREPARATION OF DISACCHARIDE FLUORIDES USING ALPHA-GLYCOSYL FLUORIDES AS SUBSTRATES

Merten Schlingmann, Königstein; Reinhold Keller, Bad Soden am Taunus; Matthias Wiesner, Mainz; Wolfgang Treder, and Joachim Thiem, both of Münster, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 216,276, Jul. 8, 1988, abandoned. This application Jun. 14, 1990, Ser. No. 545,143

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722812

Int. Cl.[5] C12P *19/12, 19/14, 19/18, 19/20*

U.S. Cl. 435—96 5 Claims

1. A process for the preparation of disaccharide fluorides, which comprises incubation of reaction solutions containing 30% to 60% by weight of substrate of α-glycosyl fluorides in solution with αglycosidases selected from the group consisting of α-glucosidase and α-galactosidase in an amount sufficient to synthesize the disaccharide fluorides, the reaction being carried out at a pH of 6 to 7.

5,068,187

PROCESS FOR PRODUCING D-α-AMINO ACIDS

Mamoru Takeichi; Naoshi Hagihara; Hitoshi Tarukawa; Shinichirou Tawaki, all of Chiba, and Nobuyoshi Makiguchi, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

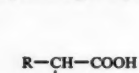
Continuation of Ser. No. 840,133, Mar. 17, 1986, abandoned. This application Mar. 28, 1989, Ser. No. 332,426

Claims priority, application Japan, Mar. 19, 1985, 60-053396

Int. Cl.[5] C12P *13/04, 13/12, 13/06;* C12N *13/16*

U.S. Cl. 435—106 4 Claims

1. A process for producing D-alpha-amino acid represented by formula (I):

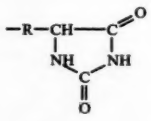


(I)

where R represents a phenyl group; a hydroxyphenyl group; an unsubstituted C_1–C_4 alkyl group or a substituted C_1–C_2 alkyl group wherein the substituent is methylthio, hydroxy, phenyl or indolyl;

comprising the steps of:

subjecting a 5-substituted hydantoin represented by formula (II):



(II)

where R represents the same meaning as in the formula (I), to the action of a cultured broth or cells of a microorganism having the ability to microbially transform said hydantoin of formula (II) into a D-α-amino acid of formula (I), said microorganism being selected from the group consisting of *Hansenula ciferrii, Hansenula henricii, Hansenula nonfermentans* and *Hansenula polymorpha*; and

purifying the thus obtained D-α-amino acid.

5,068,188

PROCESS FOR MANUFACTURE OF ALKALINE EARTH ACETATES

Donald L. Wise, Belmont, Mass.; Don C. Augenstein, Palo Alto, Calif., and Joseph D. Gresser, Brookline, Mass., assignors to Northeastern University, Boston, Mass.

Filed Jun. 20, 1989, Ser. No. 369,183

Int. Cl.[5] C12P *7/54, 39/00, 7/40;* C12N *1/20*

U.S. Cl. 435—140 10 Claims

1. A process for producing calcium and/or magnesium salts of acetic acid comprising the following steps:

fermenting biomass anaerobically in a continuous manner to form acetic acid in a fermentation broth;

extracting the acetic acid continuously from the fermentation broth with an oil phase which may optionally contain a liquid ion exchanger, resulting in the production of an organic phase consisting essentially of oil, acetic acid and optionally, a liquid ion exchanger material;

treating the acetic acid-containing organic phase directly and continuously with solid basic material containing calcium and/or magnesium metal ions, resulting in the formation of calcium and/or magnesium salt of acetic acid and water, the water forming an aqueous phase, the acetic acid salt being located substantially in the aqueous phase; and

recovering the calcium and/or magnesium salt of acetic acid from the aqueous phase.

5,068,189

RECOMBINANT DNA VECTORS ENCODING A 4"-O-ISOVALERYL ACYLASE DERIVED FROM A CARBOMYCIN BIOSYNTHETIC GENE, DESIGNATED CARE, FOR USE IN STREPTOMYCES AND OTHER ORGANISMS

Janet K. Epp, Indianapolis, and Brigitte E. Schoner, Monrovia, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 13, 1988, Ser. No. 194,672

Int. Cl.[5] C12N *15/52, 15/76, 9/00*

U.S. Cl. 435—183 27 Claims

1. A method for increasing the amount of 4"-O-isovalerylacylase enzyme in an organism that comprises (1) transforming said organism with a recombinant DNA vector that codes for expression of the Streptomyces carE gene product; and (2) culturing said organism transformed in step (1) under conditions that allow for gene expression.

5,068,190

N-ACETYLHEXOSAMINE-DEHYDROGENASE, PROCESS FOR PRODUCING SAME, METHOD FOR THE QUANTITATIVE ANALYSIS OF N-ACETYLGLUCOSAMINE OR N-ACETYLGALACTOSAMINE USING SAME AND KIT FOR USE IN THE QUANTITATIVE ANALYSIS

Tatsuo Horiuchi, Nagareyama, and Toshiko Kurokawa, Noda, all of Japan, assignors to Noda Institute for Scientific Research, Noda, Japan

Filed Sep. 14, 1989, Ser. No. 407,150

Claims priority, application Japan, Sep. 21, 1988, 63-234746

Int. Cl.[5] C12N *9/04;* C12Q *1/32*

U.S. Cl. 435—190 5 Claims

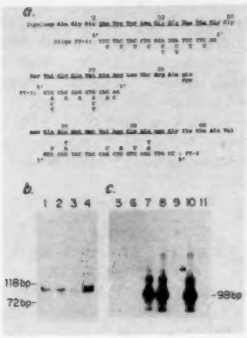
1. Purified N-acetylhexaosamine-dehydrogenase which takes off hydrogen from N-acetylglucosamine or N-acetylgalactosamine to convert them to N-acetylglucosaminolactone or N-acetylgalactosaminolactone, respectively, and at the same time reduce co-enzyme NAD^+ to NADH, of which optimum pH is 8.0 to 10.5, and of which stable pH is 8.0 to 11.0.

5,068,191

PURIFIED HISTO-BLOOD GROUP A GLYCOSYLTRANSFERASE AND ANTIBODIES THERETO

Henrik Clausen; Fumi-ichiro Yamamoto; Thayer White, and Sen-itiroh Hakomori, all of King County, Wash., assignors to The Biomembrane Institute, Seattle, Wash.

Filed Aug. 31, 1989, Ser. No. 402,695
Int. Cl.[5] C12N *9/12, 5/02;* A61K *35/14;* C12P *21/08*
U.S. Cl. 435—193 8 Claims



1. A purified histo-blood group A glycosyltransferase having the following characteristics:

a) molecular weight of approximately 40,000 as measured by sodium dodecyl sulfate-polyacrylamide gel electrophoresis; and

b) specific activity of at least approximately 5 international units per mg of protein.

5,068,192

ATTENUATED PSEUDORABIES VIRUS WHICH INCLUDES FOREIGN DNA ENCODING AN AMINO ACID SEQUENCE

Mark D. Cochran, La Jolla, Calif., assignor to Prutech Research and Development Partnership, San Jose, Calif.

Filed Jan. 27, 1986, Ser. No. 823,102
Int. Cl.[5] C12N *15/86*
U.S. Cl. 435—235.1 1 Claim

1. A non-naturally occurring, attenuated pseudorabies virus designated S-PRV-014 (ATCC Accession No. VR 2120).

5,068,193

NOVEL METHOD AND COMPOSITIONS FOR INTRODUCING ALIEN DNA IN VIVO

Luca Comai, Davis, Calif., assignor to Calgene, Inc., Davis, Calif.

Division of Ser. No. 796,484, Nov. 6, 1985, Pat. No. 4,762,785, which is a continuation of Ser. No. 407,525, Aug. 12, 1982, abandoned. This application May 11, 1988, Ser. No. 192,484
Int. Cl.[5] C12N *15/00, 15/70*
U.S. Cl. 435—252.3 9 Claims

1. An extrachromosomal element comprising: a narrow range replication system capable of replication in *E. coli* and incapable of replication in *A. tumefaciens;*

a DNA sequence of at least 800 bp homologous with a DNA sequence present in the genome of *A. tumefaciens;* alien DNA to *E. coli* and *A. tumefaciens;* a mobilization locus either being self transmissible or using a second element; and

a marker for selection in *A. tumefaciens.*

5,068,194

BACILLUS STEAROTHERMOPHILUS STRAIN HAVING A HIGH PROTOPLAST FORMING RATIO

Tadayuki Imanaka, Suita, and Shoji Sakurai, Shizuoka, both of Japan, assignors to Nikko Bio Technica Co., Ltd., Shizuoka, Japan

Filed Oct. 12, 1988, Ser. No. 256,584
Claims priority, application Japan, Oct. 12, 1987, 62-256965
Int. Cl.[5] C12N *1/20*
U.S. Cl. 435—252.5 3 Claims

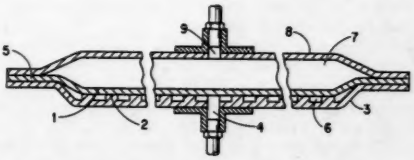
1. A substantially pure culture of *Bacillus stearothermophilis* FERM BP-3102.

5,068,195

DOT MATRIX MEMBRANE CELL EXPANSION AND MAINTENANCE VESSEL

Gary W. Howell, Elkton, Md.; Joseph D. Irr, Newark, and Ara T. Nahapetian, Wilmington, both of Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Nov. 2, 1988, Ser. No. 266,876
Int. Cl.[5] C12M *3/06, 3/00*
U.S. Cl. 435—284 10 Claims



1. A perfusable cell culture device comprising:

(1) two liquid impermeable polymeric film sheets constructed so as to deliver oxygen and carbon dioxide at rates sufficient to maintain cells in culture joined together at their peripheral edges in a sealing manner, one of the sheets defined as an upper polymeric layer and the other of the sheets defined as a lower polymeric layer;

(2) a gas and liquid permeable flow divider membrane affixed between said upper polymeric layer and said lower polymeric layer and affixed to said lower polymeric layer in such a way so as to provide channels for fluid distribution with the pressure drop across the flow divider membrane being significantly greater than pressure drop through the channels thereby providing substantially even pressure across the flow divider area and allowing the culture medium to flow uniformly over a large surface area;

(3) an inlet port in said lower polymeric layer through which culture medium can be introduced between said lower polymeric layer and said flow divider membrane;

(4) said upper polymeric layer and said flow divider membrane being arranged with respect to each other so as to form a chamber between said upper polymeric layer and said flow divider membrane through which growth medium can be perfused at a controlled rate uniformly across the surface of the flow divider membrane and in which cells are cultured; and

(5) a port in said upper polymeric layer through which cells may be placed into the cell culture device, cultured cells may be removed from said cell culture device, and perfused nutrients may be collected from said cell culture device.

5,068,196

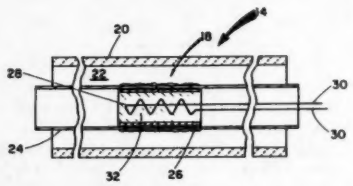
METHOD FOR DETERMINING FLUID CORROSIVENESS

George F. Hays, Morristown, and James A. Coyle, Booton, both of N.J., assignors to Ashland Oil Inc., Russell, Ky.

Division of Ser. No. 813,727, Dec. 27, 1985, abandoned. This application Feb. 27, 1990, Ser. No. 485,588

Int. Cl.[5] G01N *17/00*

U.S. Cl. 436—6 **1 Claim**



1. A method for determining corrosiveness of a fluid, which comprises:

weighing a metallic test conduit member of a predetermined length and having a channel therethrough;

positioning a cylindrically-shaped heating cartridge of a predetermined length in close fitting relationship within said channel of said metallic test conduit member, said predetermined length of said cylindrically-shaped cartridge being less than said predetermined length of said metallic test conduit member thereby defining a heat transfer surface and a non-heat transfer surface about said metallic test conduit member;

positioning said metallic test conduit member within a conduit member thereby defining a fluid flow passageway therebetween;

passing said fluid through said fluid flow passageway for a preselect time period;

energizing said heating carriage during said preselect time period;

recording rate of fluid flow and power to said heating cartridge;

removing said metallic test conduit member form within said conduit member;

removing said hating cartridge from said metallic test conduit member;

dissecting said metallic test conduit member into a portion of said heat transfer surface and a portion of said non-heat transfer surface; and

weighing said potions to provide data for evaluating with said fluid flow rate and power input of corrosion so did fluid to said heat transfer surface and said non-heat transfer surface of said metallic test conduit.

5,068,197

FECAL OCCULT BLOOD TEST METHODS

Paul J. Lawrence, Campbell, Calif., assignor to Litmus Concepts, Inc., Santa Clara, Calif.

Continuation of Ser. No. 138,496, Dec. 24, 1987, Pat. No. 4,939,097, Continuation-in-part of Ser. No. 869,573, Jun. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 680,357, Dec. 11, 1984, Pat. No. 4,615,982. This application May 17, 1990, Ser. No. 525,140

Int. Cl.[5] G01N *21/78, 33/72*

U.S. Cl. 436—66 **36 Claims**

1. A method to inhibit and thereby increase the specificity of a test for detecting the presence of iron protoporphyrins in a fecal specimen, comprising:

contacting the specimen with a solution containing a chromogen, a hydroperoxide, and an inhibitor compound, wherein the solution contains at least 50% by volume of a solvent for iron protoporphyrins and wherein the inhibitor compound is selected from the group consisting of quinine, primaquine, quinidine and mixtures thereof.

13. A colorimetric method for detecting the presence of iron protoporphyrins in a fecal specimen, comprising:

(a) pretreating the fecal specimen with an inhibitor compound selected from the group consisting of quinine, primaquine, quinidine and mixtures thereof; and then

(b) treating the fecal specimen with a hydroperoxide and a chromogen, wherein the chromogen is selected such that it will oxidize to a colored state if iron protoporphyrins are present in the specimen.

26. In an improved method for detecting the presence of a peroxidatively active substance in a sample by contacting the sample with a chromogen and a hydroperoxide, the improvement comprising applying to the sample, along with the chromogen and the hydroperoxide, an accelerator compound selected from the group consisting of chloroquine, quinacrine, and mixtures thereof, and an inhibitor compound selected from the group consisting of quinine, primaquine, quinidine and mixtures thereof.

5,068,198

LIQUID SINGLE REAGENT FOR ASSAYS INVOLVING CONFINING GELS

Ian Gibbons, Sunnyvale; Edwin F. Ullman, Atherton, and Philip L. Felgner, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 844,910, Mar. 26, 1986, abandoned. This application Jan. 13, 1989, Ser. No. 298,192

Int. Cl.[5] G01N *33/549*

U.S. Cl. 436—535 **71 Claims**

1. An assay method for determining an analyte in a sample suspected of containing the analyte wherein the analyte is a member of a specific binding pair (sbp) consisting of ligand and its complementary receptor and wherein a signal producing system is employed which provides a detectable signal in relation to the amount of analyte in said sample, said assay method comprising the steps of

a) combining a sample suspected of containing an analyte with a composition comprising in a single liquid medium (1) at least one sbp member reversibly confined in a gel rendering said sbp member incapable of binding with its complementary sbp member until such confinement is reversed wherein said outer surface of said gel is essentially free of said sbp members, and (2) said complementary sbp member wherein at least one of said sbp members is bound to a member of a signal producing system; and

b) providing means for reversing the confinement of said sbp member from said gel; and

c) measuring a signal produced in relation to the amount of analyte in said sample.

5,068,199

METHOD FOR ANODIZING A POLYSILICON LAYER LOWER CAPACITOR PLATE OF A DRAM TO INCREASE CAPACITANCE

Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 6, 1991, Ser. No. 696,438

Int. Cl.[5] H01L *21/70*

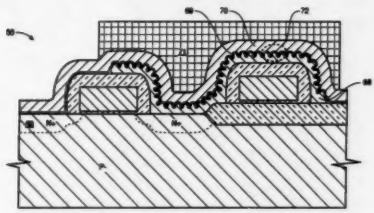
U.S. Cl. 437—52 **44 Claims**

1. A method of fabricating a storage capacitor having an intrinsic silicon layer doped with an impurity to produce an extrinsic first doped silicon conductive layer forming a storage node capacitor plate comprising the following steps:

a) anodizing said first doped silicon layer, said anodizing producing a porous upper surface by consuming portions of said first doped silicon layer to produce micro structures resembling elongated pores, a porosity of said porous upper surface measured by a porous film density, said porous film density equal to the percent of weight loss for a given volume of said first doped silicon layer experience

during said anodizing, said anodizing increasing a surface area of said storage node capacitor plate;

b) depositing a dielectric layer to overlie said first doped silicon layer, said dielectric layer having lower and upper surfaces, the porous upper surface of said first doped silicon layer being in contact at all points with the lower surface of said dielectric layer, said dielectric layer being substantially conformal with the porous upper surface of said first doped silicon layer; and



c) depositing of an intrinsic silicon layer doped with an impurity to produce an extrinsic second doped silicon conductive layer to overlie said dielectric layer, said second doped silicon layer having lower and upper surfaces, said lower surface being in contact with the upper surface of said dielectric layer and being substantially conformal thereto.

5,068,200

METHOD OF MANUFACTURING DRAM CELL

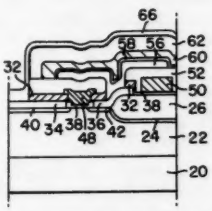
Laegu Kang, and Kyungtae Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Mar. 8, 1990, Ser. No. 490,326

Claims priority, application Rep. of Korea, Jun. 13, 1989, 89-8100

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—52 **1 Claim**



1. A method of manufacturing a DRAM cell having a stacked capacitor, comprising the steps of:

forming first and second field oxide films on a semiconductor substrate of a first conductive type, forming a channel stopper of said first conductive type on the low portion of the first field oxide film, and forming a polycrystalline silicon doped with impurities of a second conductive type and a nitride film in order;

dividing said polycrystalline silicon into drain and source polycrystalline silicon regions, and simultaneously forming a gate oxide film on the surface of said substrate between said drain and source polycrystalline silicon regions, and drain and source diffusion regions of the second conductive type and forming a gate electrode on a top portion of the gate oxide film;

forming a first insulating film on an upper surface of said nitride film and the gate electrode, and forming a window at a predetermined portion of the top portion of said source polycrystalline silicon and a storage poly contacting with the source polycrystalline silicon exposed through said window;

forming a dielectric layer which becomes a dielectric substance of the stacked capacitor and a plate poly on the top portion of said storage poly; and

forming a second insulating film on the top portion of said first insulating film and the plate poly and forming a window at a predetermined portion of the top portion of said drain polycrystalline silicon region, and a bit line contacting with the drain polycrystalline silicon region exposed through said window, wherein said polycrystalline silicon doped with impurities of the second conductive type and said nitride film are deposited over an entire area of the semiconductor substrate and the first and second field oxide films, said storage poly is contacted with the source polycrystalline silicon superposed on the first field oxide film, and said bit line is contacted with the drain polycrystalline silicon superposed on the second field oxide film.

5,068,201

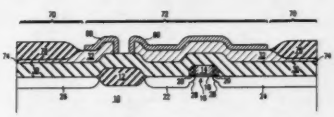
METHOD FOR FORMING A HIGH VALUED RESISTIVE LOAD ELEMENT AND LOW RESISTANCE INTERCONNECT FOR INTEGRATED CIRCUITS

Charles R. Spinner, III, Dallas, and Fu-Tai Liou, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed May 31, 1990, Ser. No. 531,022

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—60 **5 Claims**



1. A method for forming a high valued resistive load element and low resistance interconnect in a single polycrystalline silicon layer on an integrated circuit device, comprising the steps of:

forming a polycrystalline silicon layer over an insulating layer;

patterning the polycrystaline silicon layer to define the resistive load elements and the interconnect;

forming a masking layer over the device;

patterning the masking layer to expose the resistive load elements;

oxidizing the exposed polycrystalline silicon to convert a portion thereof the oxide;

removing the masking layer, thereby exposing the polycrystalline silicon interconnect;

forming a layer of refractory metal over the device; and

heating the device to cause the refractory metal to react with polycrystalline silicon in contact therewith, whereby a refractory metal silicide is formed over the interconnect.

5,068,202

PROCESS FOR EXCAVATING TRENCHES WITH A ROUNDED BOTTOM IN A SILICON SUBSTRATE FOR MAKING TRENCH ISOLATION STRUCTURES

Pier L. Crotti, Landriano, and Nadia Iazzi, Cremona, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Brianza, Italy

Filed Dec. 12, 1989, Ser. No. 448,883

Claims priority, application Italy, Dec. 15, 1988, 83689 A/88

Int. Cl.[5] H01L *21/76*

U.S. Cl. 437—67 **1 Claim**

1. A process for making an encased isolation structure for an integrated semiconductor device having the configuration of a trench, excavated on the surface of a semiconducting substrate of a first conductivity type around active areas of the front of the device and filled with a dielectric material, said semiconducting substrate having been previously covered by a multi-

layer composed of a first oxide layer, a second layer of a diffusion resistant material superimposed thereto, and a third or top layer of oxide which is thicker than the first oxide layer;

characterized by comprising the following steps:

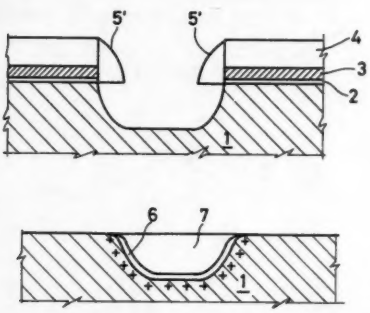
a) masking with a photoresist by a photolithographic process active areas on the front of the device;

b) anisotropically etching by means of a RIE process said three layers until exposing the surface of the underlying semiconducting substrate in the unmasked area and removing the residual masking photoresist;

c) conformably depositing a fourth oxide layer;

d) anisotropically etching by means of a RIE process said conformably deposited fourth layer of oxide until exposing the surface of the underlying semiconducting substrate in a central, self-aligned area of said unmasked area, and leaving a tapered residue of said conformably deposited fourth layer of oxide on vertical etch walls of said three layers etched during the preceding step b);

e) isotropically plasma etching said semiconducting substrate through said exposed central, self-aligned area until forming a trench having a desired depth and causing a lateral under-cut roundly extending below the base of said tapered residue of said conformably deposited fourth oxide layer;



f) removing the residual exposed oxide belonging to said third layer and to said fourth layer;

g) implanting on the etched trench surface a dopant of the same conductivity type as the semiconducting substrate for increasing the doping level of the semiconductor material adjacent to the etched trench surface by utilizing said second layer of diffusion impervious materials as a mask;

h) thermally growing a thin layer of oxide over the etched and implanted surface of the trench formed in the semiconducting substrate, by utilizing said second layer of diffusion impervious material as a mask;

i) removing said second layer of diffusion impervious material;

j) depositing a layer of dielectric material until completely filling the trench formed in the semiconducting substrate.

5,068,203

METHOD FOR FORMING THIN SILICON MEMBRANE OR BEAM

James H. Logsdon; Steven E. Staller, both of Kokomo; David W. De Roo, Carmel, and Gerold W. Neudeck, West Lafayette, all of Ind., assignors to Delco Electronics Corporation, Kokomo and Purdue Research Foundation, West Lafayette, both of, Ind.

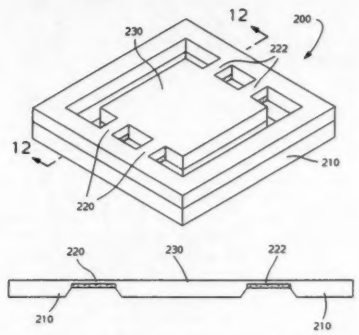
Filed Sep. 4, 1990, Ser. No. 577,656
Int. Cl.[5] H01L *21/62*
U.S. Cl. 437—89 **8 Claims**

1. A method for forming thin suspended membranes or layers of single crystal silicon suitable for use as microbridges and diaphragms in microaccelerometers and pressure sensors comprising the following steps:

providing a silicon substrate oriented essentially along a single crystallographic plane having a front and back surface which are substantially parallel to each other;

forming a blanket layer of silicon oxide overlaying said front surface of said silicon substrate;

patterning said blanket layer of silicon oxide so as to form a plurality of silicon oxide strips in spaced relationship with each other, said silicon oxide strips are spaced so that the underlying silicon substrate is exposed a gaps disposed between adjacent pairs of said strips;



selectively epitaxially depositing monocrystalline silicon onto said silicon substrate exposed at said gaps and then laterally from said gap over said silicon oxide strips so as to form a substantially continuous layer of epitaxial silicon over said plurality of silicon oxide strips;

masking said back surface of said silicon substrate so as to expose a desired pattern of said back surface of said silicon substrate; and

removing said exposed silicon from said back surface of said silicon substrate in said desired pattern;

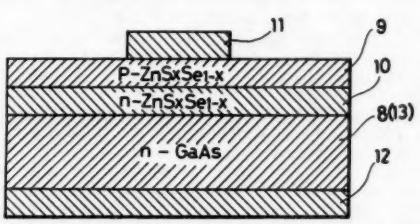
whereas said removing step is substantially terminated at said silicon oxide strips so as to form suspended regions containing said epitaxial silicon overlaying said silicon oxide strips.

5,068,204

METHOD OF MANUFACTURING A LIGHT EMITTING ELEMENT

Hiroshi Kukimoto, Kanagawa; Iwao Mitsuishi, and Takashi Yasuda, both of Tokyo, all of Japan, assignors to Misawa Co. Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,067
Claims priority, application Japan, Mar. 27, 1987, 62-71567; Sep. 25, 1987, 62-238655; Dec. 29, 1987, 62-335866
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—127 **20 Claims**



1. A method of manufacturing a light emitting element, comprising the steps of:

vapor phase growing of a II–VI compound with semicon-

ductor crystal layers having (p) type conduction of low resistivity on a semiconductor substrate;

introducing impurities of group Ia elements and their compounds, during the growth step, under the condition that the flux ratio of a group VIa element to a group IIb element ranges from 1 to 100 for constructing a basic body of said II–VI compound semiconductor crystal layers; and

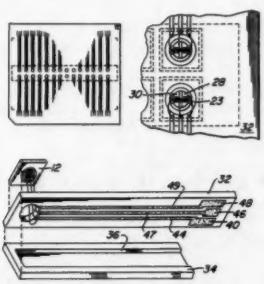
the introduction of the impurities of the group Ia elements includes a simultaneous doping of the Va elements with said group Ia elements so that the mobility thereof is suppressed, and vacancies of the VI host atoms produced by the group Ia elements acting as dopants are compensated by the doped Va elements, whereby to reduce point defects and improve the quality of the crystal layers for forming a crystal suitable for a light emitting diode.

5,068,205

HEADER MOUNTED CHEMICALLY SENSITIVE ISFET AND METHOD OF MANUFACTURE

Ronald D. Baxter, Furlong, and Paul M. Kroninger, Jr., North Wales, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed May 26, 1989, Ser. No. 357,505
Int. Cl.[5] H01L *21/58*
U.S. Cl. 437—205 **8 Claims**



1. A method for producing a header mounted solid state sensor structure for an immersible probe assembly so that it will environmentally interface the material to be tested by protecting the contacts and the sidewalls of the sensor from that material, comprising the steps of:

providing a plurality of sensor sites on a semiconductor substrate, said sites each having a chemically sensitive region on the front of said substrate and electrical contact pads on the back of the substrate, said contact pads being connected to the sensor structure;

providing a carrier for said substrate;

bonding the back of said substrate to said carrier at the periphery of said contact pads;

V-groove etching the substrate at the boundaries of the individual sensor sites to form isolated substrate mesas each representing an individual sensor structure;

deposition of a passivation coating over the sidewalls of the substrate mesas in a manner which will not obviate the sensitivity of the chemically sensitive region;

providing electrical lead-outs from said contact pads of the sensor to corresponding contact areas on the carrier arranged for connection to outside circuits; and

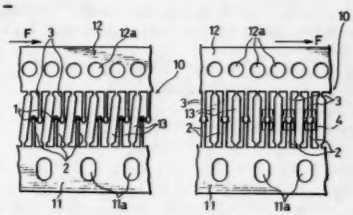
dicing the wafer at the site boundaries to produce individual header mounted solid state sensor structures.

5,068,206

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES, AND LEADFRAME AND DIFFERENTIAL OVERLAPPING APPARATUS THEREFOR

Yoshio Kurita, Kyoto, and Akira Akamatsu, Okayama, both of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Division of Ser. No. 377,969, Jul. 11, 1989. This application Dec. 11, 1990, Ser. No. 625,536
Claims priority, application Japan, Jul. 22, 1988, 63-184283; Apr. 25, 1989, 1-106471
Int. Cl.[5] H01L *23/48*
U.S. Cl. 437—220 **4 Claims**



1. A method of manufacturing semiconductor devices from an elongated leadframe which comprises at least two transversely spaced longitudinal bands connected together by connecting segments spaced longitudinally of said leadframe, one longitudinal band being formed with a first group of leads spaced longitudinally of said leadframe and extending toward the other longitudinal band, said other longitudinal band being formed with a second group of leads spaced longitudinally of said leadframe and extending toward said one longitudinal band in staggered relation to said first group of leads, the method comprising the steps of:

transferring said leadframe longitudinally thereof;

bonding semiconductor chips to said first group of leads during transfer of said leadframe;

causing said two bands to displace away from each other perpendicularly to a plane containing said leadframe;

causing said two bands to move relative to each other longitudinally of said leadframe so that each lead of said first group assumes substantially the same longitudinal position as a corresponding lead of said second group; and

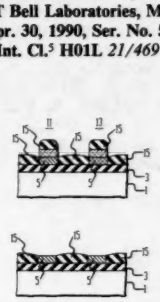
causing said two bands to displace toward each other perpendicularly to said plane so that a semiconductor chip on said each lead of said first group comes into contact with said corresponding lead of said second group for bonding.

5,068,207

METHOD FOR PRODUCING A PLANAR SURFACE IN INTEGRATED CIRCUIT MANUFACTURING

Ajit S. Manocha, and Chen-Hua D. Yu, both of Allentown, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 30, 1990, Ser. No. 516,860
Int. Cl.[5] H01L *21/469*
U.S. Cl. 437—231 **6 Claims**



1. A method of integrated circuit manufacturing comprising the steps of patterning a bilevel structure on a substrate to expose selected portions of said substrate, said bilevel structure comprising a conductor layer adjacent to said substrate and a

sacrificial layer on said conductor layer, said sacrificial layer material comprises a glass;

depositing a first dielectric in a direction substantially perpendicular to the substrate surface, said first dielectric covering no more than a portion of the sidewalls of said sacrificial layer; and,

lifting off said sacrificial layer by wet etching to leave said first dielectric on said substrate.

5,068,208

SOL-GEL METHOD FOR MAKING GRADIENT INDEX OPTICAL ELEMENTS

Niels Haun, Rochester, and Duncan T. Moore, Fairport, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Apr. 5, 1991, Ser. No. 682,200
Int. Cl.[5] C03C *3/04*
U.S. Cl. 501—12 **20 Claims**

20. A method for making a gradient-index glass comprising:

forming a mixture of a silicon alkoxide and an alcohol in a solution sufficiently acidic to partially hydrolyze the silicon alkoxide;

adding to the mixture an index modifying metal alkoxide selected from the group consisting of alkoxides of titanium and zirconium and at least one additional metal alkoxide element selected from the group consisting of alkoxides of aluminum, boron, and germanium;

adding water to the mixture containing the index modifying metal alkoxide and the at least one additional metal alkoxide element, while agitating, to convert the metal alkoxides to a network of corresponding metal oxides suitable for gelation;

molding the mixture containing the network of metal oxides for sufficient time to form a gel;

washing the molded gel with water;

acid leaching the washed gel for sufficient time to remove some of the index modifying metal oxide, wherein said acid leaching is carried out in a bath comprising water and one or more acids selected from the group consisting of hydrochloric acid, sulfuric acid, and nitric acid;

fixing the gel in an aqueous solution of 20–40 volume % of an alcohol having 1 to 4 carbon atoms;

drying the fixed gel; and

sintering the dried gel into a transparent gradient-index glass containing 60 to 98 mole % silicon oxide, 0.1 to 25 mole % of corresponding index modifying oxide, and less 25 mole % of corresponding additional metal oxide element.

5,068,209

OPTICAL FLUOROPHOSPHATE GLASS WITH ANOMALOUS POSITIVE INCREMENTAL DISPERSION AND PROCESS FOR MAKING IT

Norbert Meinert, Solms-Albshausen; Dieter Gelzenleuchter, Wetzlar, and Henning Franek, Braunfels-Tiefenbach, all of Fed. Rep. of Germany, assignors to Wild Leitz GmbH, Wetzlar, Fed. Rep. of Germany

PCT No. PCT/DE89/00422, § 371 Date Apr. 10, 1990, § 102(e) Date Apr. 10, 1990, PCT Pub. No. WO90/00159, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 24, 1989, Ser. No. 466,287
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821859
Int. Cl.[5] C03C *6/06, 3/247*
U.S. Cl. 501—30 **5 Claims**

1. Optical fluorophosphate glass produced by melting a mixture having the following composition (in % by weight):

$Ca(PO_3)_2$	1.0–2.5
$Ba(PO_3)_2$	23.0–25.5
$Al(PO_3)_3$	12.0–14.5
MgF_2	6.5–8.5
CaF_2	5.5–8.0
SrF_2	16.0–19.0
AlF_3	10.0–12.5
SrO	2.0–3.0
BaO	12.5–14.5
K_2TiF_6	0.2–0.7

wherein the alkaline earth metal fluoride content is between 28 and 35.5% by weight; the total content of all fluorides is between 38.2 and 48.7% by weight, and the F/P ratio is between 1.8 and 2.4; said glass having a refractive index n_e between 1.53 and 1.55, an Abbe number ν_e between 72.8 and 73.5, and an anomalous positive partial dispersion $\Delta\nu_e$ between +11.8 and +12.5.

5,068,210

LOW DIELECTRIC CONSTANT CERAMIC MATERIALS

John F. DiLazzaro, Lake Oswego, Oreg.; James L. McAlpin, Somers Point, N.J., and Joanne R. Mark, Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 853,515, Apr. 18, 1986, abandoned. This application May 17, 1988, Ser. No. 195,569
Int. Cl.[5] C03C *14/00, 3/108*
U.S. Cl. 501—32 **6 Claims**

4. A method of forming a dense, nonporous ceramic object having a low dielectric constant, comprising the steps of

providing a compressed mixture of finely-divided solids consisting essentially of

a) 0–30 wt % alumina

b) 30–60 wt % fused silica

c) 30–70 wt % lead borosilicate glass composed of about 25 wt % PbO, about 35 wt % B_2O_3, and about 40 wt % SiO_2,

the proportions of components a), b) and c) being chosen to provide a mixture having a sintering temperature not greater than 1000° C., and

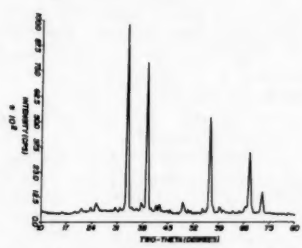
sintering the compressed mixture at a temperature not greater than 1000° C.

5,068,211

REFRACTORY AND ELECTROCONDUCTIVE CERAMIC COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Giovanni Giunchi, Novara, Italy; Ender Savrun, Tucson, Ariz.; Alberto Grenni, Segrate Milan, Italy, and Ching-Fong Chen, Tucson, Ariz., assignors to Kerag31m3o4nt Italia S.p.A., Milan, Italy

Filed Feb. 15, 1991, Ser. No. 656,770
Claims priority, application Italy, Feb. 19, 1990, 19409 A/90
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—98 **21 Claims**



1. Refractory electroconductive ceramic compositions obtained by reactive sintering of aluminum nitride with at least one oxide of a transition metal, selected from the elements belonging to groups IVB, VB, and VIB of the Periodic Chart of the Elements, at a temperature higher than 1450° C. and a pressure higher than or equal to 10 MPa, wherein a portion of

the aluminum nitride is converted to alumina and a portion of the at least one oxide is converted into a nitride.

5,068,212

OLEFIN POLYMERIZATION CATALYST AND METHOD FOR PRODUCTION AND USE

Clifford C. Lee, Houston, Tex., and M. Bruce Welch, Bartlesville, Okla., assignors to Phillips Ptroleum Company, Hartlesville, Okla.

Filed Aug. 20, 1990, Ser. No. 569,805
Int. Cl.[5] C08F 4/64
U.S. Cl. 502—105 15 Claims

1. A process for preparing an olefin polymerization catalyst comprising contacting a magnesium dihalide with a halogenated titanium alkoxide to obtain a first solid, washing said first solid until said first solid is substantially free of soluble halogenated titanium alkoxide, then contacting said first solid with titanium tetrachloride to yield a second solid.

5,068,213

COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Enrico Albizzati, Novara; Giampiero Morini, Pavia; Umberto Giannini, Milan; Luisa Barino, Novara; Raimondo Scordamaglia, Milan; Barbé Pier C., and Luciano Noristi, both of Ferrara, all of Italy, assignors to Hinmont Incorporated, Wilmington, Del.

Filed Mar. 26, 1991, Ser. No. 675,234
Claims priority, application Italy, Mar. 30, 1990, 19891 A/90
Int. Cl.[5] C08F 4/646
U.S. Cl. 502—126 6 Claims

1. A catalyst for the polymerization of olefins comprising the reaction product of:

a) an Al-alkyl compound,

b) an ether containing two or more ether groups and at least one heteroatom selected from the group consisting of N, P, S, Si, non-ether O and halogen atoms, or at least one double bond, or both at least a heteroatom and at least one double bond, and

c) a solid catalyst component comprising a magnesium dihalide in active form having supported thereon a titanium halide or alkoxyhalide and an electron-donor compound, at least 70% in moles of which can be extracted from the solid with Al-triethyl, and wherein the solid catalyst component, after extraction, has a surface area greater than 20 m^2/g.

5,068,214

PROCESS FOR THE PREPARATION OF A CATALYST

Georges Cordier, Francheville; Pierre Fouilloux, Caluire et Cuire, and Jean-Michel Grosselin, Lyon, all of France, assignors to Rhone-Poulenc Sante, Antony, France

Division of Ser. No. 319,189, Mar. 6, 1989, Pat. No. 4,973,768.
This application Aug. 28, 1990, Ser. No. 573,866
Claims priority, application France, Mar. 8, 1988, 88 02919
Int. Cl.[5] B01J 23/42, 23/89, 27/20
U.S. Cl. 502—185 1 Claim

1. Process for preparing a catalyst, comprising impregnating a support with a solution of a platinum derivative and an inorganic cobalt salt in quantities such that the Pt/Co ratio expressed in gram-atom/gram-atom is between 1/9 and 9/1 and the sum of the weights of the two metals is between 1 and 10% of the weight of the support, evaporating the solvent, and heating the impregnated support to a temperature between 400° and 500° C. for 4 to 8 hours in a stream of hydrogen; the support is iron-free charcoal having a specific surface area greater than 1000 m^2/g, the platinum derivative is chloroplatinic acid, the cobalt derivative is hydrated cobalt nitrate, and the solvent is an aromatic hydrocarbon containing 1 to 5% of an aliphatic alcohol.

5,068,215

CATALYST FOR UPGRADING LOW MOLECULAR WEIGHT HYDROCARBONS

Joseph P. Bartek, Highland Heights; James F. Brazdil, Jr., Mayfield Heights; John M. Hupp, University Heights, and Robert K. Grasselli, Aurora, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 58,016, Jun. 4, 1987, Pat. No. 4,886,931.
This application Dec. 11, 1989, Ser. No. 448,705
Int. Cl.[5] B01J 23/06
U.S. Cl. 502—208 12 Claims

1. A catalyst for the conversion of low molecular weight alkanes to higher molecular weight hydrocarbons, and having the formula

$$Zn_aA_bM_cM'_dO_x$$

wherein

A is Li, Na, K, or mixtures thereof;

M is Al, Ga, Cr, La, Y, Sc, V, Nb, Ta, Cu or mixtures thereof;

M' is Cs, Rb, Mg, Ca, Sr, Ba, Sm, Pb, Mn, Sb, P, Sn, Bi, Ti, Zr, Hf, or mixtures thereof;

a is from about 1 to about 20;

b is from about 0.1 to about 20;

c is from about 0 to about 5;

d is from about 0 to about 20; and

x is a number needed to fulfill the valence requirements of the other elements; provided that

(i) at least one of c and d is at least 0.1;

(ii) when d is 0, M is Al, Ga, Cr, La, Y, Sc, V, Nb, Ta, or mixtures thereof;

(iii) when M is Cu, M' is Mg, Ca, Sr, Ba, Sm, Pb, Sb, P, Sn, Bi, Ti, Zr, Hf, or mixtures thereof; and

(iv) when M' is Sn, Pb, or Bi, c must be at least 0.1.

5,068,216

PILLARING LAYERED SILICATES WITH A MIXTURE OF SWELLING AGENT AND PILLAR PRECURSOR

Ivy D. Johnson, Medford, and Kenneth G. Simmons, Williamstown, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation of Ser. No. 459,213, Dec. 29, 1989, abandoned.
This application Apr. 17, 1991, Ser. No. 686,844
Int. Cl.[5] B01J 21/06
U.S. Cl. 502—241 6 Claims

1. A method for preparing a layered silicate material containing interspathic polymeric oxide of at least one element selected from Groups IB, IIB, IIIA, IIIB, IVA, IVB, VA, VB, VIA, VIIA, and VIIIA of the Periodic Table, said method comprising the steps of:

(i) forming an aqueous solution of a swelling agent and a pillar precursor, said swelling agent being an organic compound which is a cationic species or capable of forming a cationic species, and said pillar precursor being capable of conversion by hydrolysis to form said interspathic polymeric oxide;

(ii) contacting a layered silicate, which contains ion exchange sites having interspathic cations associated therewith, with said mixture of step (i), whereby said organic compound is exchanged with said interspathic cations, and whereby said pillar precursor is provided between the layers of said layered silicate; and

(iii) converting said pillar precursor to interspathic polymeric oxide.

5,068,217

CARRIER CATALYSTS FOR OXIDIZING CARBON MONOXIDE AND PROCESS FOR THEIR PRODUCTION

Holger Falke, Hemmingen, and Guenther Strauss, Hanover, both of Fed. Rep. of Germany, assignors to Gutec, Hanover, Fed. Rep. of Germany

Filed Apr. 9, 1990, Ser. No. 506,345

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914294

Int. Cl.[5] B01J *23/52, 23/76*

U.S. Cl. 502—330 **22 Claims**

1. A process for producing a carrier catalyst for oxidizing carbon monoxide (CO) at temperatures below about 50° C., comprising the steps of:

a) providing a porous ceramic carrier material containing Fe_2O_3;

b) impregnating said carrier material with a solution of a gold compound and a solution of an iron compound; and

c) calcining the impregnated carrier material containing said gold compound and iron compound at a temperature of at least 200° C.,

wherein said gold compound is applied to the carrier material in such an amount that the gold content is between about 0.01% by weight and about 15% by weight relative to the total weight of the calcined carrier catalyst.

5,068,218

HONEYCOMB METAL CATALYST APPARATUS

Kimiyoshi Nishizawa, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 23, 1990, Ser. No. 527,441

Claims priority, application Japan, Jun. 1, 1989, 1-140020

Int. Cl.[5] B01J *32/00, 35/04*

U.S. Cl. 502—439 **8 Claims**

1. A honeycomb metal catalyst apparatus having a metal catalyst carrier body formed by spirally and alternately winding a first corrugated sheet-metal layer with a relatively large wave pitch P_1 and a second corrugated sheet-metal layer with a relatively small wave pitch P_2 in stacked fashion so as to form a great number of honeycomb gas flow conduits, wherein a ratio of the wave pitch of said first corrugated sheet-metal layer to the wave pitch of said second corrugated sheet-metal layer lies within a range of

$$0.75 < P_2/P_1 < 1.0$$

5,068,219

HIGH STRENGTH SUPERCONDUCTING WIRES AND CABLES EACH HAVING HIGH CURRENT DENSITY, AND A PROCESS FOR FABRICATING THEM

Sadaaki Hagino, Urawa; Motokazu Suzuki, Omiya; Hideyuki Kondo, Omiya; Shigeru Nishikawa, Omiya, and Kenichi Hayashi, Omiya, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

PCT No. PCT/JP89/00198, § 371 Date Dec. 18, 1989, § 102(e) Date Dec. 18, 1989, PCT Pub. No. WO89/08317, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 27, 1989, Ser. No. 445,639

Claims priority, application Japan, Feb. 26, 1988, 63-43530; Jun. 26, 1988, 63-43531

Int. Cl.[5] H01B *12/00, 12/02;* **H01L** *39/24*

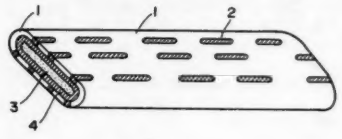
U.S. Cl. 505—1 **6 Claims**

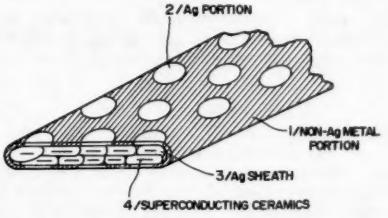
1. A superconducting structural body comprising:

an oxide based superconducting ceramics powder having a perovskite structure, and

a metal sheath surrounding the oxide based superconducting ceramics powder, the metal sheath including an Ag portion and a non-Ag metal portion, the Ag portion extending from an inner to an outer surface of the metal sheath,

the non-Ag metal portion used as a structural material of an outermost layer of the metal sheath, the superconducting ceramics powder portion and the non-Ag metal portion being separated from each other with Ag material therebetween, and the superconducting ceramics powder having a compressed oriented layer in which a C-axis of the





crystal in the superconducting ceramics powder is oriented in a direction of the superconducting structural body, and in which a thickness thereof is not smaller than 5 μm.

5,068,220

BIODEGRADABLE POLYAMIDES FOR PROVIDING A CONTROLLED RELEASE THERAPEUTIC DRUG

David P. Vanderbilt; Donald R. Cowsar, both of Birmingham, Ala.; Richard L. Dunn, Collins, Colo., and James P. English, Birmingham, Ala., assignors to Sharpoint L.P., Reading, Pa.

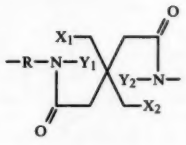
Division of Ser. No. 224,316, Jul. 26, 1988, Pat. No. 4,950,735. This application Jun. 8, 1990, Ser. No. 534,974

Int. Cl.[5] A61K *37/26, 31/765*

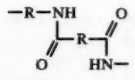
U.S. Cl. 514—3 **5 Claims**

1. A controlled release formulation comprising an organic polymer and an effective amount of a therapeutic drug, wherein the structural formula of said polymer includes

a backbone containing n biradical units of the formula



joined randomly with m biradical units of the formula



wherein

n is a positive integer;

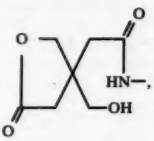
m is either zero or a positive integer;

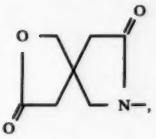
each R independently is a hydrocarbon radical;

X_1 is —OH and Y_1 is —H, or X_1 and Y_1 together constitute a chemical bond in a lactam ring;

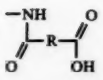
X_2 is —OH and Y_2 is —H, or X_2 and Y_2 together constitute a chemical bond in a lactam ring;

said backbone being capped with a radical selected from





—NH_2, or



when m is a positive integer;
with the proviso that the polymer contains lactam units when m is zero.

5,068,221

TREATMENT OF MOTILITY DISORDERS WITH A GNRH ANALOG

John R. Mathias, 1215 Spring Creek La., Seabrook, Tex. 77586

Filed May 9, 1989, Ser. No. 349,717
Int. Cl.[5] C07K *7/00*; A61K *37/43, 37/38, 37/00*
U.S. Cl. 514—15 **12 Claims**

1. The process for treating a subject exhibiting the symptoms of Motility Disorders, comprising:

administering to the subject a therapeutically effective dosage of a compound comprising an analog of Gonadotropin Releasing Hormone.

5,068,222

BOMBESIN ANTAGONISTS WITH DELETION OF NET-RESIDUE AT THE C-TERMINUS

Roger Camble, Macclesfield; Ronald Cotton, Congleton; Anand S. Dutta, Stockport, and Christopher F. Hayward, Macclesfield, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 1, 1988, Ser. No. 265,566
Claims priority, application United Kingdom, Nov. 2, 1987, 8725598; Feb. 15, 1988, 8803478; Jun. 6, 1988, 8813355
Int. Cl.[5] A61K *37/02*; C07K *7/06*
U.S. Cl. 514—15 **9 Claims**

1. A polypeptide of formula I:

$$R^1\text{-}A^1\text{-}A^2\text{-}A^3\text{-}A^4\text{-}A^5\text{-}A^6\text{-}A^7\text{-}A^8\text{-}A^9\text{-}Q \qquad I$$

wherein

R^1 is hydrogen or (1–6C)alkyl which may optionally bear a phenyl substituent, and wherein said phenyl substituent may optionally bear a substituent selected from halogeno, (1–4C)alkyl, (1–4C)alkoxy, hydroxy, cyano and nitro, or R^1 is (2–6C)alkanoyl which may optionally bear one or more substituents selected from carboxy, (1–4C)alkoxycarbonyl, amino, (1–4C)alkylamino, di[(1–4C)alkyl]amino, phenyl, phenoxy, naphthyl, imidazolyl, napthyloxy, pyridyl, indolyl and thienyl, and wherein any one or more of said aryl, phenoxy, naphthyloxy or heteroaryl groups may optionally bear one or more substituents selected from halogeno, (1–4C)alkyl, (1–4C)alkoxy, hydroxy, cyano and nitro; or

R^1 is (4–6C)cycloalkoxycarbonyl; or R^1 is (1–4C)alkoxycarbonyl which may optionally bear one or two phenyl substituents and wherein either one or both of said phenyl substituents may optionally bear a halogeno, nitro or (1–4C)alkoxy substituent;

wherein A^1 is a direct link to A^2, or is Gly, Arg, D-Arg, Lys, Lys(Z), Phe, D-Phe, Asp, L-Nal, D-Nal, D-pcF, D-pfF, D-dcF, Pro, D-Deh, βAla or Glp;

wherein A^2 is a direct link to A^3, or is Gly, Pro or Asn;

wherein A^3 is a direct link to A^4, or is Lys, Lys(Z), D-Nal or D-pcF;

wherein A^4 is His, D-His, MeHis, EtHis, PrHis, His(τ-Me), His(π-Me), D-Gln, D-Glu(OMe), D-Glp, Leu, D-Leu, MeLeu, Lys, Pal, D-Pal, Phe, D-Phe, Pro, Arg, Glu, His(COPh), Trp or Thr;

wherein A^5 is Trp, MeTrp, Trp(Me), Trp(For), Val, DL-Flg, L-Nal, pcF, Leu, Lys, Pal, Cha, Lys(Z(2Cl)) or Lys($COCH_3$);

wherein A^6 is Ala, MeAla, Aib, Gly, Pro, Leu, Phe, D-Phe, Ser, Val, L-Nal, Thr, Arg or Glu;

wherein A^7 is Val, MeVal, Aib, Leu, Ile, Thr(CH_2Ph), Thr, Phe, D-Phe, Lys(Z(2Cl)), Ser or DL-Flg;

wherein A^8 is Gly, Sar, Ala, D-Ala, D-Ser, D-Ser(CH_2Ph), D-pcF, D-Ala(NH_2), D-Ala(NHZ(Cl)), Aib, D-Pro, D-Lys, Asp, D-Arg, D-Lys(Z(2Cl)), Val, Ac^3c, Ac^5c or Ac^6c;

wherein A^9 is His, MeHis, His(τ-Me), His(π-Me), D-pcF, Aib, Val, Leu, MeLeu, Ala, Ile, Ahx, Ape, Met, Pro, Phe, D-Phe, Gln, Lys, Lys(Z), Pal, Ser, Ser(CH_2Ph), Thr, Thr(CH_2Ph), Glu, Asp, Asp(OBu^t), Trp or L-Nal; and

wherein Q is a group of the formula $-A^{10}.R^2$ in which A^{10} is Leu, D-Leu, MeLeu, Ile, MeIle, Ahx, MeAhx, Aib, Pro, Val, MeVal, Phe, Ape, MeApe, Met, Ser, Gln, Glu or Trp and R^2 is hydroxy or amino; or R^2 is (1–3C)alkylamino, dialkylamino of up to 4 carbon atoms, or (1–3C)alkoxy, each optionally bearing a hydroxy, (1–3C)alkoxy, amino, (1–6C)alkylamino, dialkylamino of up to 8 carbon atoms, or phenyl-(1–3C)alkylamino substituent, other than in a position alpha to an oxygen or nitrogen atom, or a fluoro-(1–3C)alkyl or phenyl substituent; or

R^2 is (3–6C)cycloalkylamino, N-alkyl-N-cycloalkylamino of up to 8 carbon atoms, or dicycloalkylamino of up to 12 carbon atoms; or R^2 is 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl or 4-methylpiperazin-1-yl; or

Q is (1–6C)alkoxy, (1–10C)alkylamino or dialkylamino of up to 10 carbon atoms each optionally bearing a hydroxy, amino, (1–3C)alkoxy, (1–6C)alkylamino, dialkylamino of up to 8 carbon atoms, phenyl-(1–3C)alkylamino substituent, other than in a position alpha to an oxygen or nitrogen atom, or a phenyl substituent; or Q is phenyl-(1–3C)alkylamino; or

Q is (3–6C)cycloalkylamino, N-alkyl-N-cycloalkylamino of up to 8 carbon atoms or dicycloalkylamino of up to 12 carbon atoms; or Q is 1-azetidinyl, 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl or 1-homopiperidinyl each optionally bearing on any available position, including on any available nitrogen atom, a substituent selected from (1–6C)alkyl, phenyl and phenyl-(1–3C)alkyl; and wherein within R^2 or Q a phenyl group may optionally bear a substituent selected from halogeno, (1–4C)alkyl, (1–4C)alkoxy, hydroxy and cyano;

or a pharmaceutically-acceptable salt of said polypeptide; provided that when $-A^4\text{-}A^5\text{-}A^6\text{-}A^7\text{-}A^8\text{-}A^9\text{-}A^{10}-$ is -His-Trp-Ala-Val-Gly-His-Leu-, and $-A^1\text{-}A^2\text{-}A^3-$ is a direct link, then R^1 is not hydrogen or acetyl.

5,068,223

HYDROPHOBIC PEPTIDE ESTERS AND AMIDES

Peter E. Lipsky, and Dwain L. Thiele, both of Dallas, Tex., assignors to Board of Regents, University of Texas System

Continuation-in-part of Ser. No. 168,177, Mar. 15, 1988, which is a continuation of Ser. No. 774,051, Sep. 9, 1985, Pat. No. 4,752,603. This application Mar. 15, 1989, Ser. No. 324,151

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[5] A61K *37/02*

U.S. Cl. 514—019 28 Claims

1. A method for deactivating natural killer cells or cytotoxic T-lymphocytes comprising the step of treating said cells with an aqueous solution comprising a biologically effective level of a dipeptide in ester of N-substituted amide form, said dipeptide containing at least one of L-leucine, L-phenylalanine, L-valine, L-isoleucine, L-alanine, L-proline, glycine, and L-aspartic acid beta methyl ester, said ester form being an alkyl, aryl, alkaryl or aralkyl ester and said N-substituted amide form being an aryl, aralkyl or alkaryl N-substituted amide.

5,068,224

METHOD OF IMPROVING REGENERATION OF TRANSFECTED PERIPHERAL NERVES USING IGF-1

Linda Fryklund, Sollentuna; Hans A. Hansson, Hovas; Martin Kanje, Sodra Sandby, and Anna Skottner, Ekero, all of Sweden, assignors to KabiVitrum AB, Sweden

Filed Sep. 16, 1988, Ser. No. 245,146

Claims priority, application Sweden, Sep. 18, 1987, 8703625

Int. Cl.[5] A61K *37/24*

U.S. Cl. 514—21 6 Claims

1. A method for improving the regeneration of transected peripheral nerves in mammals, by administering a therapeutically effective amount of insulin-like growth factor I (IGF-1) to ganglia in the affected nerves of a mammalian host in need of such treatment.

5,068,225

VISCOELASTIC FLUID FOR USE IN SURGERY AND OTHER THERAPIES AND METHOD OF USING SAME

Phillip E. Pennell, Denver, Colo.; John M. Blackmore, Redwood, Calif., and Mark D. Allen, Lakewood, Calif., assignors to MDR Group, Inc., Denver, Colo.

Continuation of Ser. No. 266,648, Nov. 3, 1988, Pat. No. 4,983,585, which is a continuation-in-part of Ser. No. 45,326, May 4, 1987, abandoned. This application Aug. 10, 1990, Ser. No. 565,491

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/715, 47/00*

U.S. Cl. 514—57 9 Claims

1. A method of protecting the intraocular surfaces of an eye of a mammal during ophthalmic surgery including the steps of:

introducing into the eye as an aqueous/vitreous substitute, in order to protect internal eye tissues, a viscoelastic composition which comprises a solution of a cellulose derivative and polyethylene oxide (PEO in a physiologically compatible liquid, the composition being physiologically compatible with the intraocular surfaces of eye of the mammal; and

performing the ophthalmic surgery.

5,068,226

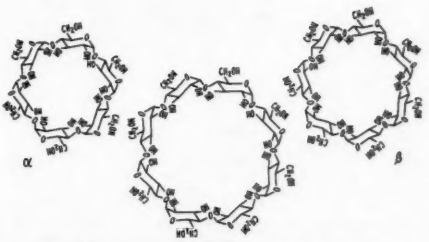
PHARMACEUTICAL PREPARATIONS CONTAINING CYCLODEXTRINS AND THEIR USE IN IONTOPHORETIC THERAPIES

Ned M. Weinshenker, Palo Alto, and William P. O'Neill, Los Altos, both of Calif., assignors to Cyclex, Inc., New Brunswick, N.J.

Continuation of Ser. No. 129,187, Dec. 7, 1987, abandoned. This application Apr. 30, 1990, Ser. No. 516,295

Int. Cl.[5] A01N *43/04;* A61F *13/60*

U.S. Cl. 514—58 17 Claims



1. A method for the iontophoretic administration of a pharmacologically active agent to a mammalian patient comprising:

(a) contacting an epithelial surface of the patient with a pharmaceutical preparation comprising:

(i) a cyclodextrin;

(ii) an effective concentration of the pharmacologically active agent that forms with the cyclodextrin an inclusion complex having a net ionic charge;

(iii) a water-based fluid carrier medium in which the active agent is dispersed and in admixture with the cyclodextrin; and thereafter

(b) applying to the preparation on the surface an electrical current effective to bring about iontophoretic transport to the pharmacologically active agent across the surface into the patient's body.

5,068,227

CYCLODEXTRINS AS CARRIERS

Ned M. Weinshenker, Palo Alto, Calif., assignor to Cyclex, Inc., New Brunswick, N.J.

Filed Jan. 18, 1989, Ser. No. 298,634

Int. Cl.[5] A61K *31/70;* C08B *37/16;* G01N *33/533*

U.S. Cl. 514—58 28 Claims

1. An active agent-tagged biorecognition molecule comprising said biorecognition molecule covalently bonded to a cyclodextrin with said active agent noncovalently included within the cavity of the cyclodextrin.

5,068,228

USE OF A METAL CHELATE OF AN ALKYLAMINOESTER OF PHOSPHORIC ACID FOR PROPHYTLAXIS OR THERAPY OF A NEUROPATHY

Gernot Köhler, Neue Bergstrasse 3 - 7, 6146 Alsbach-Hähnlein, Fed. Rep. of Germany

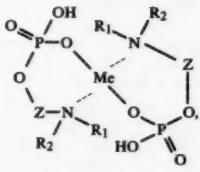
Filed Aug. 11, 1988, Ser. No. 231,015

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726721

Int. Cl.[5] A01N *57/10;* A61K *31/66*

U.S. Cl. 514—114 25 Claims

1. A pharmaceutically effective composition for the therapeutic treatment of a patient having neuropathies of the peripheral nervous system whose pathogenesis is attributable to changes in the nerve cells and which reduces the conduction velocity thereof, comprising a pharmaceutically effective amount of a compound which is selected from a group of compounds having the structural formula:



wherein Me is calcium R_1 and R_2 each means hydrogen or a lower alkyl radical (n=1, 2) or a combination of both, Z means a lower alkyl radical of straight or branched chain (n=1, 2, 3, 4) or a monocarboxylic acid (n=2, 3, 4) or a combination of alkyl radical and monocarboxylic acid, and wherein n identifies the number of carbon atoms.

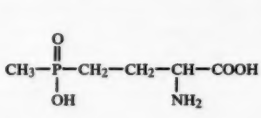
5,068,229

INSECTICIDAL METHOD

Marc Benoit, Roquevaire, and Jean-Pierre Demoute, Auriol, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 23, 1990, Ser. No. 557,186
Int. Cl.[5] A01N *57/00*
U.S. Cl. 514—114 **9 Claims**

1. A method of combatting insects comprising contacting the insects with an insecticidally effective amount of at least one member of the group consisting of glufosinate of the formula



I

and its salts.

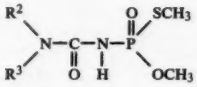
5,068,230

N-(((ALKOXY(ALKYLTHIO)PHOSPHINYL)AMINO)-CARBONYL)-AMINOALKANOATE ESTER INSECTICIDES

Walter Reifschneider, Walnut Creek; Barat Bisabri-Ershadi, Davis; James E. Dripps, Concord, and J. Brian Barron, Benicia, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 10, 1989, Ser. No. 419,056
Int. Cl.[5] A01N *57/28, 57/30*
U.S. Cl. 514—115 **18 Claims**

1. A compound of the formula



wherein

R represents C_1–C_4 alkyl;

R^2 represents $—CH(R^4)—(CH_2)_n—A$ and R^3 represents H or C_1–C_4 alkyl;

A represents CO_2R or $CONR^5{}_2$;

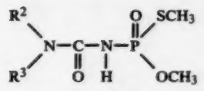
R^4 represents H, C_1–C_4 alkyl, $—(CH_2)_m—A$, $—(CH_2)_m—SCH_3$, or $—C_6H_5$;

each R^5 independently represents H or C_1–C_4 alkyl;

m represents 1 or 2; and

n represents 0, 1, or 2.

11. A method of controlling insects which comprises contacting the insects or the locus thereof or the plants on which the insects feed or the locus thereof with an insecticidally effective amount of a compound of the formula



wherein

R represents C_1–C_4 alkyl;

R^2 represents $—CH(R^4)—(CH_2)_n—A$ and R^3 represents H or C_1–C_4 alkyl;

A represents CO_2R or $CONR^5{}_2$;

R^4 represents H, C_1–C_4 alkyl, $—(CH_2)_m—A$, $—(CH_2)_m—SCH_3$, or $—C_6H_5$;

each R^5 independently represents H or C_1–C_4 alkyl;

m represents 1 or 2; and

n represents 0, 1, or 2.

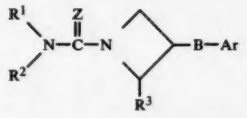
5,068,231

METHOD OF TREATING MUSCULAR TENSION, MUSCLE SPASTICITY AND ANXIETY WITH 3-ARYLOXY AND 3-ARYLTHIOAZETIDINECARBOXAMIDES

Chandler R. Taylor, Jr.; Albert D. Cale. Jr., both of Mechanicsville; David N. Johnson, Richmond, and Harold F. Stauffer. Jr., Midlothian, all of Va., assignors to A. H. Robins Company Incorported, Richmond, Va.

Continuation-in-part of Ser. No. 706,632, Feb. 28, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 921,521
Int. Cl.[5] A61K *31/55, 31/495, 31/40, 31/395*
U.S. Cl. 514—210 **112 Claims**

1. A method of treating muscle tension and muscle spasticity in mammals in need thereof by administering an effective amount of about 4–40 mg/kg body weight per day of a compound selected from the group having the formula:



wherein:

Ar is selected from pyridyl in any of its positions optionally substituted by halo, from phenyl or phenyl substituted by 1 or 2 groups selected from chloro, bromo, iodo, fluoro, loweralkyl, loweralkoxy, nitro, aminocarbonyl, or trifluoromethyl;

B is oxygen or sulfur;

Z is oxygen or sulfur;

R^1 and R^2 may be the same or different and are selected from hydrogen, loweralkyl, aryl, allyl, substituted allyl, propargyl, cycloalkyl (3–9C), loweralkylcycloalkyl, cycloalkylloweralkyl, arylloweralkyl, and diloweralkylaminoloweralkyl, and R^1 and R^2 when taken together with the adjacent nitrogen atom may form a heterocyclic amino group selected from azetidinyl, pyrrolidinyl, piperidinyl, homopiperidinyl, imidazolyl, piperazinyl, (halophenyl)-piperidine-yl, phenyl-1,2,3,6-tetrahydropyridin-1-yl, phenylpiperidin-1-yl, hydroxypiperidin-1-yl, 4-morpholino, 4-(3,5-diloweralkyl)morpholino, 1,2,3,6-tetrahydropyridin-1-yl, (halophenyl) (hydroxy)piperidin-1-yl, 4-(2,6-diloweralkyl)morpholino pyrrolo[1,2-a]pyrazin-2-yl, homopiperazinyl, 4-substituted piperazinyl, and 4-substituted homopiperazinyl.

R^3 is selected from hydrogen, loweralkyl, aryl or arylloweralkyl; the geometrical isomers thereof, and the pharmaceutically acceptable acid addition salts thereof when R^1 and R^2 have one or more salt-forming basic amino components or Ar is pyridyl, and the hydrates thereof, with the proviso that when R^3 is hydrogen, Z is oxygen, B is oxy-

gen, and Ar is phenyl or phenyl substituted by trifluoromethyl or aminocarbonyl, if R^1 is hydrogen, R^2 is other than loweralkyl, and if R^2 is loweralkyl, R^1 is other than hydrogen.

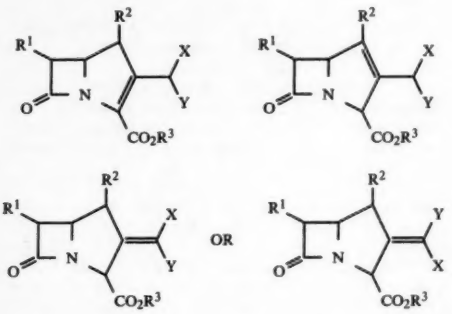
5,068,232

NOVEL 2-SUBSTITUTED ALKYL-3-CARBOXY CARBAPENEMS AS ANTIBIOTICS AND A METHOD OF PRODUCING THEM

Carl B. Ziegler, Jr.; William V. Curran, both of Pearl River, and Gregg Feigelson, Spring Valley, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 10, 1990, Ser. No. 507,271
Int. Cl.[5] C07D *477/00;* A01K *31/40*
U.S. Cl. 514—210 **8 Claims**

1. A 2-substituted alkyl-3-carboxy carbapenem compound having the formula:



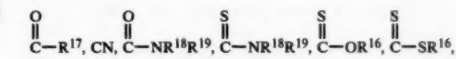
wherein R^1 is hydrogen; a straight-chain or branched lower alkyl group selected from ethyl, n-propyl, n-butyl, isobutyl, sec-butyl, tert-butyl, n-pentyl, or isopentyl; a straight-chained or branched lower alkoxy group selected from methoxy, ethocy, n-propoxy; isopropoxy, n-butoxy, isobutoxy, sec-butoxy, or tert-butoxy; or an R^4 B group (wherein R^4 is a hydroxyl group; a lower alkoxy group selected from methoxy, ethoxy, n-propoxy, or isopropoxy; fluoride; an acyloxy group selected from acetoxy, propionyloxy, n-butyryloxy, or isobutyryloxy; or an aralkyloxycarbonyloxy group selected from benxyloxycarbonyloxy or p-nitrobenzyloxycarbonyloxy; a lower alkylsulfonyloxy group selected from methanesulfonyloxy, ethanesulfonyloxy, or propanesulfonyloxy; an arylsulfonyloxy group selected from benzenesulfonyloxy or p-toluenesulfonyloxy; a lower trialkylsilyloxy group selected from trimethylsilyloxy or tert-butyldimethylsilyloxy; a mercapto group; a lower alkylthio group selected from methylthio, ethylthio, n-propylthio, or isopropylthio; an amino group; or a lower aliphatic acylamino group selected from acetylamino, propionylamino, n-butyrylamino, or isobutyrylamino; and B is an alkylene group that may have trifluoromethyl or phenyl substituents, selected from methylene, ethylene, ethylidene, trimethylene, propylidene, isopropylidene, tetramethylene, butylidene, pentamethylene, pentylidene, 2,2,2-trifluoroethylidene, 3,3,3-trifluoropropylidene, or benzylidene);

R^2=hydrogen, C_1–C_6 alkyl, phenyl and C_1–C_6 alkyl substituted phenyl;

R^3 is a hydrogen atom; a straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, or tert-butyl; a lower haloalkyl group selected from 2-iodoethyl, 2,2-dibromoethyl, or 2,2,2-trichloroethyl; a lower alkoxymethyl group selected from methoxymethyl, ethoxymethyl, n-propoxymethyl, isopropoxymethyl, n-butoxymethyl, or isobutoxymethyl; a lower aliphatic acyloxymethyl group selected from acetoxymethyl, propionyloxymethyl, n-butyryloxymethyl, isobutyryloxymethyl, or pivaloyloxymethyl; a 1-(lower alkoxy)carbonyloxyethyl group selected from 1-methoxycarbonyloxyethyl, 1-ethoxycarbonyloxyethyl, 1-n-propoxycarbonyloxyethyl, 1-isopropoxycarbonyloxyethyl, 1-n-butoxycarbonyloxyethyl, or 1-isobutoxycarbonyloxyethyl; an aralkyl group selected from benzyl, p-methoxybenzyl, o-nitrobenzyl, or p-nitrobenzyl; a benzhydryl group; a phthalidyl group, a silyl selected from trimethylsilyl or t-butyldimethylsilyl or 2-trimethylsilylethyl; an allylic group selected from allyl, 2-chloro-2-propenyl, 2-butenyl, 3-methyl-2-butenyl or 2-cinnamyl or water soluble cation selected from lithium, sodium, potassium, ammonium or tetraalkyl ammonium (alkyl of C_1–C_4);

X=F, Cl, Br, I;

Y=CO_2H, CO_2R^{16},



SO_2R^{17}, SOR^{17}, SR^{17}, F, Cl, Br,I;

R^{16}=a straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl; a lower haloalkyl group selected from 2-chloroethyl, 3-chloropropyl, 2-iodoethyl, 2,2-dibromoethyl or 2,2,2-trichloroethyl; a lower trimethylsilylalkyl group selected from 2-trimethylsilylethyl; substituted allyl selected from 2-chloro-2-propenyl, 3-methyl-2-propenyl, 3-methyl-2-butenyl, 3-phenyl-2-propenyl; a lower alkyl-t-butyldimethylsiloxy group of 2–4 carbon atoms selected from 2-[t-butyldimethylsiloxy]ethyl or 2-[t-butyldimethylsiloxy]propyl; a lower alkyl-hydroxy group of 2–4 carbon atoms selected from 2-hydroxyethyl, 3-hydroxylpropyl or 3-hydroxy-n-butyl; phenyl; an alkylheteroaryl group with 1–3 carbon atoms in the alkyl chain attached to a 5- or 6-membered heteroaryl ring that contains 1–4 o, N or S atoms attached through a ring carbon or nitrogen; a alkylheterocycle group with 1–3 carbon atoms in the alkyl chain attached to a 5- or 6-membered ring that contains 1–4 O, N or S atoms attached through a ring carbon or ring nitrogen;

R^{17}=1) a phenyl ring, optionally substituted by 1–3 substituents independently selected from 1a) halogens (F, Cl, Br, I) and/or trifluoromethyl; 1b) C_1–C_4 branched or linear alkyl; 1c) hydroxy or protected hydroxy group, amino or protected amino group, thiol or protected thiol group; 1d) alkenyl and alkynyl groups having 1–4 carbon atoms selected from ethenyl, 1-propenyl, 2-propenyl, 3-propenyl, ethylnyl, 1-proynyl; 1e) a carboxy or carboxamido group; 1f) a 5- or 6-membered heteroaryl ring that contains 1–4 O, N or S atoms attached through a ring carbon or nitrogen; 1g) a heterocycle group that contains 1–4 O, N or S atoms attached through a ring carbon or nitrogen;

2) a fused phenyl ring, optionally one that is fused to a 5- or 6-membered heteroaryl ring containing 1–3 O, N or S atoms and optionally substituted by 1–3 substituents independently selected from 1a) through 1e) above;

3) a 5- or 6-membered heteroaryl ring that contains 1–4 O, N or S atoms attached through a ring carbon and optionally substituted by 1–3 substituents independently selected from 1a) through 1e) above; or fused to another unsaturated ring selected from a phenyl ring or a 5- to 6-membered saturated or unsaturated heterocyclic ring containing 1–3 O, N or S atoms;

R^{18} and R^{19} are independently selected from hydrogen; substituted or unsubstituted alkyl having from 1–10 carbon atoms; substituted or unsubstituted cycloalkyl having from 1–10 carbon atoms; aralkyl, selected from phenyl alkyl and heterocycloalkyl wherein the alkyl has 1–6 carbon atoms and the heteroatom or atoms are selected from O, N and S; and cyclic group wherein R^{18} and R^{19} together form a ring which optionally may be substituted by amino, mono, di- and trialkylamino (each alkyl having 1–6 C atoms), hydroxyl, carboxyl, alkoxyl having from

1–6 carbon atoms, halo such as chloro, bromo, fluoro, nitro, sulfonamido, phenyl, benzyl and alkoxylcarbonyl having 1–3 carbon atoms in the alkoxy moiety.

5,068,233

SYNERGISTIC COMBINATION OF AZELASTINE AND THEOPHYLLINE OR AZELASTINE AND α-MIMETICS

Ute Achterrath-Tuckerman, Maintal; Rudolf Aurich, Karben; Jürgen Engel, Alzenau; Helmut Hettche, Dietzenbach, and Axel Kleeman, Mühlheim/M, all of Fed. Rep. of Germany, assignors to Asta Pharma Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 144,176, Jan. 15, 1988, abandoned. This application Dec. 11, 1989, Ser. No. 449,318

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701287

Int. Cl.[5] A61K *31/55*

U.S. Cl. 514—212 **9 Claims**

1. A pharmaceutical composition useful for the treatment of asthmatic, antiallergic and antihistaminic symptoms and also with asthma prophylactic activity containing as active substances a member of the group consisting of (a) a synergistic combination of azelastine and theophylline in an amount of 3 to 5000 parts by weight for each part by weight of azelastine, or (b) a synergistic combination of azelastine and at least one β-mimetic or salts of these compounds with physiologically acceptable acids in an amount of 0.0003 to 1000 parts by weight for each part of weight of azelastine.

5,068,234

3-ARYLCARBONYL-1-(C-ATTACHED-N-HETERYL)-1H-INDOLES

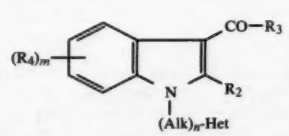
Thomas E. D'Ambra, North Greenbush; Edward R. Bacon; Malcolm R. Bell, both of East Greenbush; Philip M. Carabateas, Schodack; Michael A. Eissenstat, West Sand Lake; Virendra Kumar, Colonie; John P. Mallamo, Kinderhook Township, Columbia County, and Susan J. Ward, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 26, 1990, Ser. No. 484,759

Int. Cl.[5] C07D *417/06, 413/06;* **A61K** *31/54, 31/535*

U.S. Cl. 514—235.2 **18 Claims**

1. A member of the group consisting of (A) compounds having the formula:



where:

R_2 is hydrogen or lower-alkyl;

R_3 is phenyl (or phenyl substituted by from one to two substituents selected from halogen, lower-alkoxy, hydroxy, lower-alkyl, nitro, amino, lower-alkylamino, dilower-alkylamino, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl and methylenedioxy), 2- or 4-biphenyl of 1- or 2-naphthyl (or 1- or 2-naphthyl substituted by from one to two substituents selected from lower-alkyl, lower-alkoxy, halogen, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl and trifluoromethyl);

R_4 is hydrogen, lower-alkyl, hydroxy, lower-alkoxy or halogen at the 4-, 5-, 6- or 7-positions;

m is 1 or 2

Alk is lower-alkylene containing from one to four carbon atoms which may contain a lower-alkyl group;

Het is an aliphatic heterocycle selected from the group consisting of 2- or 3-morpholinyl (or 2- or 3-morpholinyl substituted on any available carbon atom thereof by lower-alkyl and 2- or 3-thiomorpholinyl (or the S-oxides thereof, or 2- or 3-thiomorpholinyl, or the S-oxides thereof, substituted on any available ring carbon atom thereof by lower-alkyl), where each of said Het groups may be either unsubstituted on the nitrogen atom thereof or substituted thereon by a lower-alkyl, benzyl, lower-alkoxybenzyl or benzhydryl group; and

n is 0 or 1, except that n is not 0 when the Alk moiety is attached to a ring carbon atom adjacent to a ring N, O or S atom of a Het group; and (B) pharmaceutically-acceptable acid-addition and lower-alkyl quaternary ammonium salts thereof.

5,068,235

DIAZABICYCLOALKANE DERIVATIVE

Etsuo Hasegawa, Omiya; Akihiro Kawaguchi, Honjo; Makoto Kajitani, Saitama; Mitsugi Yasumoto, Honjo; Nobuo Kasahara, and Junji Yamamoto, both of Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

PCT No. PCT/JP89/01316, § 371 Date Aug. 16, 1990, § 102(e) Date Aug. 16, 1990, PCT Pub. No. WO90/07509, PCT Pub. Date Jul. 12, 1990

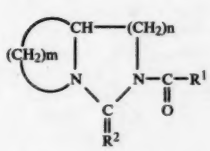
PCT Filed Dec. 27, 1989, Ser. No. 566,456

Claims priority, application Japan, Dec. 28, 1988, 63-335159

Int. Cl.[5] A61K *31/505, 31/44, 31/415;* **C07D** *515/02*

U.S. Cl. 514—258 **9 Claims**

1. A diazabicycloalkane derivative represented by the formula



(1)

wherein R^1 is a phenyl group, thienyl group or furyl group, the phenyl group may have a lower alkoxyl, a lower alkyl or a halogen atom as a substituent, R^2 is an oxygen atom or a sulfur atom, m is 3 or 4, and n is 1 or 2, provided that when m is 4 and n is 1, R^1 is not a phenyl group.

5,068,236

XANTHINE DERIVATIVES

Fumio Suzuki, Mishima; Junichi Shimada, Shizuoka; Kazuhiro Kubo; Tetsuji Ohno, both of Shizuoka, all of Japan; Akira Karasawa, Huntingdon Valley, Pa.; Akio Ishii, and Hiromi Nonaka, both of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

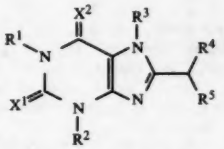
Filed Mar. 1, 1990, Ser. No. 486,831

Claims priority, application Japan, Mar. 6, 1989, 1-53376; Sep. 1, 1989, 1-226643

Int. Cl.[5] A61K *31/52;* **C07D** *473/00*

U.S. Cl. 514—263 **5 Claims**

1. A xanthine compound represented by the following formula:



wherein each of R^1, R^2 and R^3 independently represents hydrogen or lower alkyl; each of R^4 and R^5 independently represents substituted or unsubstituted alicyclic alkyl, and each of

X^1 and X^2 independently represents oxygen or sulfur, or its pharmaceutically acceptable salt.

5. A diuretic, renal-protecting and vasodilative composition comprising a pharmaceutical carrier and, as an active ingredient, an amount of a xanthine compound as defined by claim 1, effective to have diuretic, renal protective and vasodilative activity, or a pharmaceutically acceptable salt thereof.

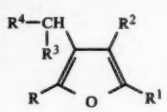
5,068,237

SUBSTITUTED FURANS AND DERIVATIVES THEREOF ACTING AT MUSCARINIC RECEPTORS

Sheila H. Hobbs, Dexter, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

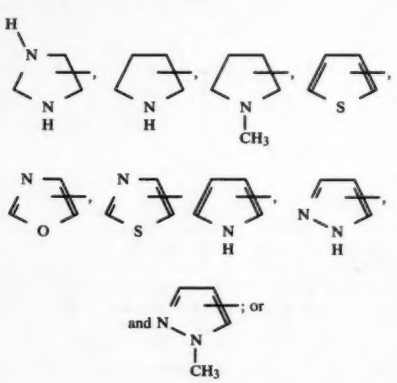
Filed May 21, 1990, Ser. No. 526,406
Int. Cl.[5] A61K *31/415;* C07D *405/06*
U.S. Cl. 514—365 **6 Claims**

1. A compound of Formula I



I

wherein R, R^1, and R^2 are each independently hydrogen, alkyl of from one to ten carbon atoms, alkynyl of from two to ten carbon atoms, phenyl or phenyl substituted by one to four substituents selected from the group consisting of alkyl, alkoxy, thioalkoxy, halogen, and trifluoromethyl; R^3 is hydrogen, hydroxy or alkoxy of from one to ten carbon atoms; and R^4 is selected from the group consisting of



a pharmaceutically acceptable acid addition salt thereof.

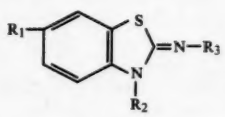
5,068,238

2-ALKYLIMINOBENZOTHIAZOLINE DERIVATIVES, PROCESSES FOR PREPARING THEM AND MEDICINAL PRODUCTS CONTAINING THEM

Patrick Jimonet, Villepreux, and Conception Nemecek, Choisy le Roi, both of France, assignors to Rhone-Poulenc Sante, Antony Cedex, France

Filed Jun. 29, 1990, Ser. No. 545,822
Claims priority, application France, Jul. 13, 1989, 89 09481
Int. Cl.[5] C07D *277/82;* A61K *31/425*
U.S. Cl. 514—367 **4 Claims**

1. A compound of formula:



(I)

in which

R_1 represents a polyfluoroalkoxy radical,

R_2 represents an alkylthioalkyl, alkylsulphinylalkyl or alkylsulphonylalkyl radical, and

R_3 represents an alkyl radical,

on the understanding that the alkyl radicals and alkyl and alkoxy portions contain 1 to 4 carbon atoms in a straight or branched chain, as well as its addition salts with an inorganic or organic acid.

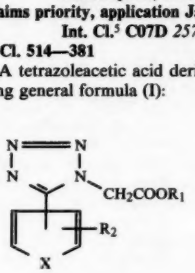
5,068,239

TETRAZOLEACETIC ACID DERIVATIVES AND USE FOR ALDOSE REDUCTASE INHIBITORY ACTIVITY

Sinji Inukai, Hatano; Mitsuzi Agata, Kanagawa; Manami Umezawa, Morinosato; Yoshihiro Horio, Hatano; Yasuhiro Ootake, Minami-ashigara; Shohei Sawaki, Kanagawa, and Masayoshi Goto, Isehara, all of Japan, assignors to Wakamoto Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 588,057
Claims priority, application Japan, Oct. 3, 1989, 1-257086
Int. Cl.[5] C07D *257/04;* A61K *31/41*
U.S. Cl. 514—381 **20 Claims**

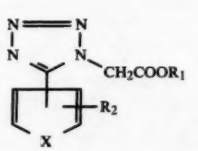
1. A tetrazoleacetic acid derivative represented by the following general formula (I):



(I)

[in Formula (I), R_1 represents a hydrogen atom or an alkyl group; R_2 represents a hydrogen atom, an alkyl group, an aralkyl group, a halogen atom, a haloalkyl group, a hydroxyl group, an alkoxy group, an alkoxyalkyl group, an amino group, an aryl group, an alkyl or aryl thio group, an alkyl or aryl carbonylamino group, an alkyl or aryl sulfonylamino group, an alkyl or aryl aminosulfonyl group, an alkyl or aryl sulfonyl group or an alkyl or aryl sulfinyl group; and X represents —O— or —S—] except for [5-(2-thienyl)tetrazol-1-yl] acetic acid, [5-(2-furyl)tetrazol-1-yl] acetic acid and ethyl esters thereof, or a salt thereof.

13. A method for alleviating or reducing diabetic complications wherein a tetrazoleacetic acid derivative represented by the following general formula (II):



(II)

[in Formula (II), R_1 represents a hydrogen atom or an alkyl group; R_2 represents a hydrogen atom, an alkyl group, an aralkyl group, a halogen atom, a haloalkyl group, a hydroxyl group, an alkoxy group, an alkoxyalkyl group, an amino group, an aryl group, an alkyl or aryl thio group, an alkyl or aryl carbonylamino group, an alkyl or aryl sulfonylamino group, an alkyl or aryl aminosulfonyl group, an alkyl or aryl sulfonyl

group or an alkyl or aryl sulfinyl group; and X represents —O— or —S—] or a salt thereof is used.

5,068,240

ANTITUMOR PHARMACEUTICAL COMPOSITIONS AND PROCESS FOR PREPARING THE SAME

Ádám Kovacs, Buza u 2, H-2097 Pilisborosjenö, Hungary

PCT No. PCT/HU84/00062, § 371 Date Aug. 20, 1985, § 102(e) Date Aug. 20, 1985, PCT Pub. No. WO85/02769, PCT Pub. Date Jul. 4, 1985

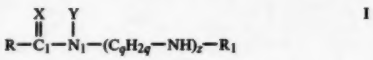
Continuation-in-part of Ser. No. 346,369, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 770,349, Aug. 20, 1985, abandoned. This PCT application Dec. 18, 1984, Ser. No. 533,943

Claims priority, application Hungary, Dec. 20, 1983, 4348/83

Int. Cl.[5] A61K *31/21, 31/26, 31/415*

U.S. Cl. 514—401 13 Claims

1. A method for the treatment of a patient affected by malignant cells which are sensitive to a compound of formula I, said method comprising administering to the patient a composition comprising a physiologically acceptable carrier and at least one compound of formula I in an amount which is effective for the control of said sensitive malignant cells, said at least one compound having the general formula:



I

wherein

R is a saturated or unsaturated aliphatic hydrocarbon group having twelve to twenty carbon atoms;

R_1 is hydrogen or a saturated or unsaturated acyl radical having twelve to twenty carbon atoms;

X is oxygen;

Y is hydrogen, or

X and Y, when taken together, form a bridging radical of formula $=N—CH_2—CH_2—$ wherein the nitrogen of the bridging radical is bonded to C_1 and the other end of the bridging radical is bonded to N_1;

z is 1 to 5; and

q is 1 to 4.

5,068,241

PESTICIDAL SUBSTITUTED PYRAZOLINE DERIVATIVES, COMPOSITIONS AND USE

Rainer Fuchs, Wuppertal; Christoph Erdelen, Leichlingen, both of Fed. Rep. of Germany; Benedikt Becker, Appiano, Italy, and Wilhelm Stendel, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

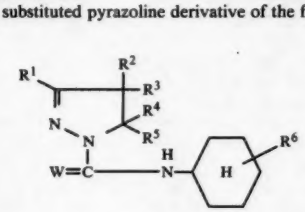
Filed Feb. 7, 1991, Ser. No. 652,169

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005114

Int. Cl.[5] A01N *43/56;* C07D *231/06*

U.S. Cl. 514—403 13 Claims

1. A substituted pyrazoline derivative of the formula



(I)

in which

R^1 represents optionally substituted phenyl or optionally substituted alkyl,

R^2 represents hydrogen, optionally substituted phenyl, optionally substituted alkyl or alkoxycarbonyl,

or R^1 and R^2 together represent an optionally benzo-fused alkylene radical,

R^3 represents hydrogen or alkyl,

R^4 represents hydrogen, optionally substituted phenyl or optionally substituted alkyl,

R^5 represents hydrogen or optionally substituted alkyl,

R^6 represents halogenoalkyl or halogenoalkoxy, and

W represents oxygen or sulphur.

5,068,242

PYRROLIDINE-2-CARBOXYLIC ACID DERIVATIVES AND THEIR USE FOR PSYCHOTROPIC ACTION

Wolf-Ulrich Nickel, Bad Soden am Taunus; Wolfgang Rüger, Kelkheim; Hansjörg Urbach, Kronberg/Taunus, and Franz Hock, Dieburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

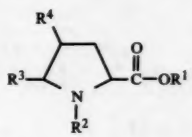
Filed Nov. 17, 1989, Ser. No. 437,890

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1988, 3839127

Int. Cl.[5] C07D *209/52;* A61K *31/40*

U.S. Cl. 514—412 4 Claims

1. A compound of the formula I



(I)

in which

R^1 is hydrogen, C_1-C_8-alkyl, C_2-C_6-alkenyl, C_3-C_9-cycloalkyl, amino-C_1-C_4-alkyl, C_2-C_5-acylamino-C_1-C_4-alkyl, C_7-C_{13}-aroylamino-C_1-C_4-alkyl, C_6-C_{12}-aryl-C_1-C_6-alkyl or C_6-C_{12}-aryl;

R^2 is C_1-C_8-alkanoyl, C_6-C_{12}-aryl-C_1-C_6-alkanoyl, C_1-C_4-alkoxycarbonyl-C_1-C_7-alkanoyl C_6-C_{12}-aryloxycarbonyl-C_1-C_7-alkanoyl, C_1-C_4-acyl-C_2-C_6-alkanoyl, C_1-C_4-acylamino-C_1-C_6-alkanoyl or C_7-C_{13}-aroyl-C_1-C_6-alkanoyl;

R^3 and R^4 together with the atoms carrying them form a monocyclic alicyclic or aromatic ring system selected from the group consisting of cyclopentane, cyclopentene, cyclohexane and benzene, and their physiologically acceptable salts, with the exception of compounds in which at the same time R^1 is hydrogen, benzyl or n-octyl, R^2 is tert.-butoxycarbonyl and R^3 and R^4 together with the atoms carrying them form a cyclopentene ring and compounds in which R^2 is α-acylamino-C_1-C_6-alkanoyl.

4. A process for the treatment and prophylaxis of cognitive dysfunctions, which comprises administering an active amount of a compound of the formula I as claimed in claim 1, or a physiologically acceptable salt thereof.

5,068,243

BICYCLIC TETRAHYDROXYPYRROLIZIDINE

George W. J. Fleet, Oxford, United Kingdom, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 404,800, Sep. 8, 1989, Pat. No. 4,992,460, and a continuation-in-part of Ser. No. 524,514, May 17, 1990, Pat. No. 5,021,562. This application Aug. 7, 1990, Ser. No. 564,009

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/40;* C07D *487/04, 491/22, 493/04*

U.S. Cl. 514—413 5 Claims

1. (1S,2R,6R,7S)-1,2,6,7-tetrahydroxypyrrolizidine.

2. The method of inhibiting a glycosidase enzyme in a biological fluid containing said enzyme comprising subjecting said fluid to an effective amount of the compound of claim 1 suitable to inhibit said glycosidase.

4. 7-O-tert-Butylidiphenylsilyl-2,3:5,6-di-O-isopropylidene-D-glycero-D-talo-heptono-1,4-lactone.

5. (1S,2R,6R,7S)-1,2:6,7-di-O-isopropylidene-1,2,6,7-tetrahydroxypyrrolizidine.

5,068,244

BENZOCYCLOHEXANES AND ANALGESIC COMPOSITIONS THEREOF

Anne-Marie Moura; Francois Clemence; Daniel Frechet, and Michel Fortin, all of Paris, France, assignors to Roussel Uclaf, Paris, France

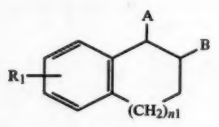
Filed Feb. 17, 1989, Ser. No. 312,885

Claims priority, application France, Feb. 18, 1988, 88 01928

Int. Cl.[5] A61K *31/40;* **C07D** *207/08*

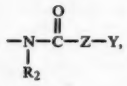
U.S. Cl. 514—428 **9 Claims**

1. A compound selected from the group consisting of all possible enantiomeric and diastereoisomeric forms of compounds of the formula

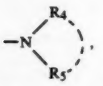


I

wherein R_1 is $—NO_2$, n' is 1, A and B have the trans configuration, one of A and B being



R_2 is hydrogen or alkyl of 1 to 5 carbon atoms, Z is $(CH_2)_{n2}—$, n_2 being an integer from 0 to 5 or branched alkyl of 2 to 8 carbon atoms or $—CH_2—O—$, Y is selected from the group consisting of phenyl, naphthyl and indenyl, all optionally having at least one substituent selected from the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, halogens, $—CF_3$, $—NO_2$, $—NH_2$ and mono- and dialkylamino and the other of A and B is



R_4 and R_5 together with the nitrogen to which they are attached form a 5 to 6 ring heterocycle selected from the group consisting of pyrrolidinyl, piperazinyl, piperidinyl and morpholinyl and their non-toxic, pharmaceutically acceptable acid addition salts.

5,068,245

FUNGICIDAL N-SUBSTITUTED 3-ARYLPYRROLIDINE DERIVATIVES

Matthias Zipplies, Hirschberg; Hubert Sauter, Mannheim; Franz Roehl, Ludwigshafen; Walter Himmele, Walldorf; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,243

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732930

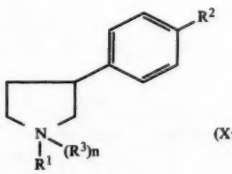
The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.

Int. Cl.[5] A01N *43/36, 43/08, 43/28;* **C07D** *207/06*

U.S. Cl. 514—429 **11 Claims**

1. N-Substituted 3-arylpyrrolidine derivatives of the formula

I



(I)

(X—),

where

R^1 is 2,2-dimethylpropyl, 3,3-dimethylbutyl, 4,4-dimethylpentyl, 2,4,4-trimethylpentyl, 6-methylhept-2-yl, 3,5,5-trimethylhexyl, 6,10-dimethylundec-2-yl, 3-methylcyclohexyl, 3,3-dimethylcyclohexyl, 3,3,5-trimethylcyclohexyl, 3,3,5,5-tetramethylcyclohexyl, 4-methylcyclohexyl, 4-ethylcyclohexyl, 4-propylcyclohexyl, 4-isopropylcyclohexyl, 4-tert.-butylcyclohexyl, 4-(2-methylbut-2-yl)cyclohexyl, 4-(2,4,4-trimethylpent-2-yl)-cyclohexyl, cyclododecanyl, C_3–C_9-trialkylsilyl-substituted C_4–C_{12}-cycloalkyl, 4-hydroxy-cyclohexyl, 4-hydroxy-3-methylcyclohexyl, 4-hydroxy-3,5-dimethylcyclohexyl, 4-hydroxy-3,3-dimethylcyclohexyl, 4-hydroxy-3,3,5-trimethylcyclohexyl, unsubstituted or hydroxy-, C_1–C_9-alkyl-, C_1–C_5-alkoxy- or C_3–C_9-trialkylsilyl-substituted C_5–C_{12}-cycloalkenyl,

R^1 is further C_9–C_{11}-bicycloalkyl which is unsubstituted or substituted by hydroxy, C_1–C_6-alkyl, C_1–C_5-alkoxy, C_3–C_9-trialkylsilyl, acetoxy, benzoyloxy or benzyloxy,

R^1 is further 4-tert.-butyl-benzyl, 4-chlorobenzyl, 4-tert.-butoxybenzyl, 1,4-dioxaspiro[4,5]decan-8-yl,

5 to 7-membered heterocycloalkyl having 1 or 2 heteroatoms selected from the group consisting of oxygen and sulfur,

5 to 7-membered heterocycloalkylmethyl having 1 or 2 heteroatoms selected from the group consisting of oxygen and sulfur, C_1–C_8-alkyl-substituted 5 to 7-membered heterocycloalkyl or heterocycloalkylmethyl having 1 or 2 heteroatoms selected from the group consisting of oxygen and sulfur,

R^2 is C_3–C_8-alkoxy or C_3–C_9-trialkylsilyl,

R^3 is C_1–C_5-alkyl, C_3–C_6-alkenyl, C_3–C_6-alkynyl or C_7–C_{10}-arylalkyl,

X- is a plant-tolerated anion, and

n is 0 or 1,

or plant-tolerated salts thereof.

5,068,246

FUNGICIDAL N-SUBSTITUTED 3-ALKYL-4-ARYLPYRROLIDINE DERIVATIVES

Matthias Zipplies, Hirschberg; Hubert Sauter, Mannheim; Walter Himmele, Walldorf; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,252

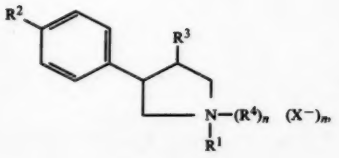
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732910

The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.

Int. Cl.[5] A01N *43/36, 43/08, 43/28;* C07D *207/06*

U.S. Cl. 514—429 6 Claims

1. N-substituted 3-alkyl-4-aryl-pyrrolidine derivatives of the formula



(I)

where

R^1 is C_2–C_{20}-alkyl which is unsubstituted or substituted by hydroxy, halogen, C_1–C_5-alkoxy or C_3–C_9-trialkylsilyl, C_3–C_{20}-alkenyl, C_3–C_{20}-alkynyl, C_4–C_{12}-cycloalkyl which is unsubstituted or substituted by hydroxy, C_1–C_5-alkoxy or C_3–C_9-trialkylsilyl, C_4–C_{12}-cycloalkenyl, C_4–C_{20}-alkylcycloalkyl which is unsubstituted or substituted by hydroxy, C_4–C_{20}-cycloalkyl-alkyl, C_4–C_{20}-alkyl-cycloalkylalkyl, C_4–C_{20}-cycloalkenyl-alkyl, C_4–C_{20}-alkyl-cycloalkenyl, hydroxy-substituted or unsubstituted C_9–C_{11}-bicycloalkyl, C_{10}–C_{15}-bicycloalkylalkyl, hydroxy-substituted or unsubstituted C_{10}–C_{15}-alkylbicycloalkyl,

5 to 7-membered heterocycloalkyl having 1 to 2 heteroatoms selected from the group consisting of oxygen and sulfur, 5 to 7-membered heterocycloalkylmethyl having 1 or 2 heteroatoms selected from the group consisting of oxygen and sulfur, C_1–C_8-alkyl-substituted 5 to 7-membered heterocycloalkyl or heterocycloalkylmethyl having 1 or 2 heteroatoms selected from the group consisting of oxygen and sulfur, substituted or unsubstituted aryl, substituted or unsubstituted C_7–C_{20}-arylalkyl, C_7–C_{20}-alkylaryl, C_8–C_{20}-alkyl-aryl-alkyl, wherein the aryl substituents are selected from the group consisting of hydroxy, halo, C_1–C_5-alkoxy and C_3–C_9-trialkylsilyl,

R^2 is C_{3-C8}-alkoxy,

R^3 is C_1–C_4-alkyl,

R^4 is C_1–C_5-alkyl, C_3–C_5-alkenyl, C_3–C_5-alkynyl or C_7–C_8-phenylalkyl,

X^- is a plant-tolerated anion,

n is 0 or 1,

or a plant-tolerated salt thereof.

5,068,247

2-AMINOPENTANOIC ACID COMPOUNDS AND THEIR USE AS IMMUNOSUPPRESSANTS

Tetsuro Fujita, Muko; Takeshi Ikumoto; Shigeo Sasaki, both of Kobe; Chiba Kenji, and Yukio Hoshino, both of Tokyo, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka and Taito Co., Ltd., Tokyo, both of, Japan

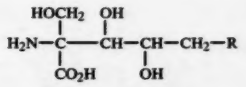
Filed Jul. 5, 1990, Ser. No. 549,137

Claims priority, application Japan, Jul. 7, 1989, 1-176914

Int. Cl.[5] A61K *31/385*

U.S. Cl. 514—440 4 Claims

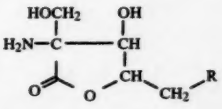
1. A 2-aminopentanoic acid compound represented by the formula



(I)

wherein R is a straight or branched chain alkyl of 1 to 30 carbon atoms, a hydroxyalkyl wherein the alkyl moiety has 1 to 6 carbon atoms or a group represented by the formula: $-CH{=}CH(CH_2)_nCH{=}CH{-}CH(OH){-}(CH_2)_mCH_3$ wherein n and m stand for an integer of 1 to 10, respectively; $-CH{=}CH(CH_2)_p{-}C(=X){-}(CH_2)_qCH_3$ wherein $>C{=}X$ stands for

wherein A is an alkylene of 1 to 4 carbon atoms, $>C{=}N{-}OB$ wherein B is a hydrogen or a straight or branched alkyl of 1 to 4 carbon atoms, or $>CHNH_2$ wherein p and q are respectively an integer of 1 to 10; or $-CH{=}CH{-}Y$ wherein Y is a straight or branched alkyl of 1 to 30 carbon atoms, a salt thereof, a γ-lactone compound thereof having the formula



wherein R is as defined above and a compound protected by an amino or hydroxy-protecting group.

3. An immunosuppressant comprising a compound as claimed in claim 1.

5,068,248

N-ALKENYL-3-HYDROXYBENZO[B]THIOPHENE-2-CARBOXAMIDE DERIVATIVES AS DUAL CYCLOOXYGENASE AND LIPOXYGENASE INHIBITORS

Allan N. Tischler, Oakland, Calif.; Philippe L. Durette, New Providence, N.J.; Bruce E. Witzel, Westfield, N.J.; Kathleen M. Rupprecht, Cranford, N.J.; Timothy F. Gallagher, Harleysville, Pa.; Marvin M. Goldenberg, Westfield, and Debra L. Allison, Basking Ridge, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 172,538, Mar. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 705,115, Feb. 27, 1985, Pat. No. 4,760,086, which is a continuation-in-part of Ser. No. 596,134, Apr. 2, 1984, abandoned. This application Jun. 22, 1989, Ser. No. 369,982

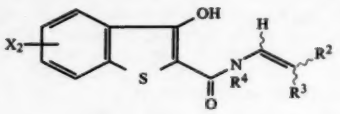
Int. Cl.[5] A61K *31/38*

U.S. Cl. 514—443 4 Claims

1. A method treatment of pain, fever, and inflammation comprising:

administration to a subject in need of such treatment, a

non-toxic, therapeutically effective amount of compound of formula:



or a pharmaceutically acceptable salt thereof wherein: R^2 and R^3 independently are

(a) phenyl of formula

wherein X_5 and X_6 independently are

(1) Q where Q is H, loweralkyl or halololoweralkyl;

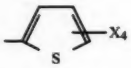
(2) halo;

(3) SQ;

(4) OQ; or

(5) SOQ;

(b) thienyl of formula



wherein X_4 represents Q or halo

R^4 is H or loweralkyl; and

X_2 is

(a) Q;

(b) halo;

(c) OQ;

(d) phenyl;

(e) 5-(2,4-difluorophenyl);

(f) SO; or

(g) CF_3CONH—.

5,068,249

AQUEOUS RANITIDINE COMPOSITIONS STABILIZED WITH ETHANOL

David R. Long, Royston, England, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 344,620, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 131,442, Dec. 11, 1987, abandoned. This application Mar. 14, 1990, Ser. No. 494,804

Claims priority, application United Kingdom, Dec. 12, 1986, 86 29781

Int. Cl.[5] A61K *31/34*

U.S. Cl. 514—471 **12 Claims**

1. A pharmaceutical composition which is an aqueous formulation for oral administration of an effective amount of ranitidine and/or one or more physiologically acceptable salts thereof, said formulation comprising a stabilizing effective amount of ethanol and said composition having a pH in the range of 6.5–7.5.

5,068,250

IRREVERSIBLE LIGANDS FOR NONSTEROIDAL ANTIINFLAMMATORY DRUG AND PROSTAGLANDIN BINDING SITES

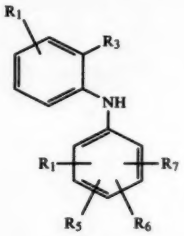
Trevor M. Penning, Springfield, Pa., and Leslie J. Askonas, Haddonfield, N.J., assignors to Trustees of University of Pennsylvania, Philadelphia, Pa.

Filed Sep. 29, 1988, Ser. No. 251,550

Int. Cl.[5] A01N *37/00, 37/12, 37/07;* **A61K** *31/22;* **C07C** *303/00, 261/00*

U.S. Cl. 514—506 **11 Claims**

1. A compound selected from those of the formulae



(ii)

where

R_1 is independently selected from the groups consisting of H, $NHCOCH_2Z$, $OCOCH_2Z$, $COCH_2Z$, CH_2N_3, and CH_2OSO_2Me;

R_3 is selected from the groups consisting of Y, CH_2Y, $CH(CH_3)Y$ and Y is selected independently from the groups consisting of COOH, COOMe, COOEt, CH_2O-$COCH_2Z$, $CH_2NHCOCH_2Z$, CH_2N_3, CH_2OSO_2Me, and $COCH_2Z$;

$S(O)CH_3$, NO_2,NH_2, OH, CH_3, CH_2Z, CHZ_2, and CZ_3;

R_5, R_6, and R_7 are selected independently from the groups consisting of H, Z, CH_3, CH_2Z, CHZ_2, CZ_3, NO_2, and OH;

where Z is a halogen atom;

provided that for compounds of formulae (ii), if R_1=H in both rings, Y is other than COOH, COOMe or COOEt; and if Y=COOH, COOMe, or COOEt, R_1 is other than H in both rings.

6. The compound of claim 1 where said compound is N-(4-bromoacetamidophenyl) anthranilic acid.

10. A pharmaceutical composition comprising a compound of claim 6 or its pharmaceutically acceptable salt.

5,068,251

LIPOXYGENASE INHIBITING COMPOUNDS

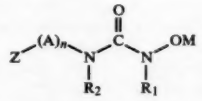
Dee W. Brooks, Libertyville, and Karen E. Rodriques, Grayslake, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 16, 1988, Ser. No. 285,439

Int. Cl.[5] C07C *275/68;* **A61K** *31/17*

U.S. Cl. 514—506 **5 Claims**

1. A compound of the formula



wherein A is —CH_2—; n is 0 or 1; R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl alkenyl, aralkyl and cycloalkyl; Z is the residue from a non-steroidal anti-inflammatory carboxylic acid compound selected from ibuprofen and naproxen; and M is a pharmaceutically acceptable cation or a metabolically cleavable group; or a pharmaceutically acceptable salt thereof.

5,068,252

METHODS OF USING PHENYLETHENYL COMPOUNDS HAVING RETINOID-LIKE ACTIVITY

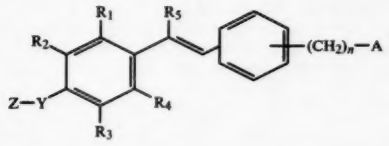
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 385,626, Jul. 26, 1989, Pat. No. 4,992,468. This application Feb. 8, 1991, Ser. No. 653,540

Int. Cl.[5] A61K *31/235*

U.S. Cl. 514—543 **23 Claims**

1. A method for treating dermatoses including psoriasis, in a mammal which method comprises administering a therapeutically effective amount of a compound of the formula



in which:

R_1, R_2, R_3 and R_4 are hydrogen, lower alkyl, halogen or lower alkoxy;

R_5 is hydrogen or lower alkyl;

Y is oxygen or sulfur;

Z is 1–10 carbon straight or branched alkyl, or 2–10 carbon straight or branched chain alkenyl or alkynyl;

n is 0–5; and

A is COOH, $COOR_7$, $CONHR_7$, $CON(R_7)_2$, $—CH_2OH$, $—CH_2OR_7$, CH_2OCOR_7, —CHO, $CH(OR_8)_2$, $CHOR_9O$, $—COR_6$, $CR_6(OR_8)_2$, or CR_6OR_9O where R_6 is $—(CH_2)_mCH_3$ where m is 0–4, R_7 is alkyl of 1 to 10 carbons or aryl or alkyl-aryl group, R_8 is lower alkyl, and R_9 is divalent alkyl radical of 2 to 5 carbons, or administering a pharmaceutically acceptable salt of said compound.

5,068,253

TREATMENT OF A MICROBIAL INFECTION WITH DRUGS CONTAINING PARA-ACETAMIDOBENZOIC ACID

Joseph Kovacs, Potomac; Henry Masur, Bethesda, and Carmen Allegra, Gaithersburg, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 11, 1990, Ser. No. 551,521

Int. Cl.[5] A61K *31/185*

U.S. Cl. 514—553 **8 Claims**

1. A method of treating or prventing a microbial infection in a patient comprising administering to said patient an antimicrobially effective amount of p-acetamidobenzoic acid or a pharmaceutically acceptable salt thereof so that said microbial infection is inhibited or prevented.

5,068,254

PROCESS FOR THE PREPARATION OF HYDROCARBONS

Sytze A. Posthuma, The Hague; Johannes D. de Graaf, and Jan Boelen, both of Rotterdam/Pernism, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 7, 1990, Ser. No. 520,333

Claims priority, application United Kingdom, May 15, 1989, 8911076

Int. Cl.[5] C07C *1/04*

U.S. Cl. 518—705 **5 Claims**

1. Process for the preparation of hydrocarbons by a catalytic reaction of a mixture of carbon monoxide and hydrogen, comprising the steps of:

(i) providing a gas mixture comprising carbon monoxide and hydrogen and at least one impurity selected from hydrogen cyanide and ammonia;

(ii) washing in a wash zone said gas mixture in a first washing step using reaction water and a second washing step with an aqueous solution comprising chemicals promoting the absorption of the impurities; to obtain a washed gas mixture having a reduced level of impurities and a fat aqueous solution containing impurities from said gas mixture;

(iii) separating said fat aqueous solution from the mixture;

(iv) contacting said washed gas mixture at an elevated temperature and pressure with a catalyst whereby a hydrocarbon-containing reaction product and reaction water are obtained;

(v) separating said reaction water from said hydrocarbon product; and

(vi) recycling at least part of said reaction water solution to said wash zone of step (ii).

5,068,255

ION EXCHANGE RESINS PREPARED BY SEQUENTIAL MONOMER ADDITION

William I. Harris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 797,716, Nov. 13, 1985, abandoned, which is a continuation of Ser. No. 506,911, Jun. 22, 1983, Pat. No. 4,564,644, which is a continuation of Ser. No. 404,028, Aug. 2, 1982, abandoned. This application May 1, 1987, Ser. No. 44,543

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.[5] C08J *5/20*; C08F *2/00*

U.S. Cl. 521—28 **16 Claims**

1. A process for preparing crosslinked copolymer beads comprising:

(a) forming a suspension of a first monomer mix comprising from about 80 to about 99.95 parts by weight of a monoethylenically unsaturated monomer, about 0.05 to about 20 parts by weight of a polyethylenically unsaturated monomer and a sufficient amount of a substantially water-insoluble free radical initiator to catalyze the polymerization of said first monomer mix and a second monomer mix, then

(b) polymerizing said first monomer mix until about 10 to about 80 weight percent of said monomers are converted to crosslinked polymer particles, the

(c) adding to said suspension a second monomer mix, which second monomer mix comprises at least one ethylenically unsaturated monomer but contains essentially no free radical initiator, said addition of said second monomer mix being made under conditions including a temperature sufficient to initiate the free radical polymerization of the monomer in said second monomer mix such that said monomer mix is imbibed by said crosslinked polymer particles and the polymerization of said second monomer mix within said crosslinked polymer particles is catalyzed by the free radical initiator contained in said first monomer mix and wherein the monomers of the second monomer mix, when polymerized, comprise from about 5 to about 90 weight percent of the product copolymer beads.

5,068,256

BUBBLE-CONTAINING ETHYLENE/α-OLEFIN RUBBER

Takashi Nakahara; Toshiaki Kimura, and Takashi Mishima, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 13, 1989, Ser. No. 420,883

Claims priority, application Japan, Oct. 14, 1988, 63-258922; Sep. 22, 1989, 1-247687

Int. Cl.[5] C08C *4/00*

U.S. Cl. 521—150 **7 Claims**

1. A storage-stable, non-vulcanized, easily-kneadable bubble-containing ethylene/α-olefin rubber composition consisting essentially of:

(A) a base rubber comprising a copolymer of

(1) from about 50 to 95 mol % of ethylene;
(2) about 5 to 50 mol % of α-olefin having at least 3 carbon atoms; and
(3) about 0 to 10 mol % of nonconjugated polyene; and
(B) containing 5–1000 parts by volume, based on 100 parts by volume of said base rubber, of bubbles and providing a water absorption volume as measured in accordance with ASTM D 1506 of less than 20% by volume of the total volume of bubbles.

5,068,257

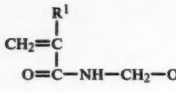
RESIN COMPOSITION CURABLE WITH AN ACTIVE ENERGY RAY CONTAINING HALF-ESTERIFICATED EPOXY RESIN AND MONOMER HAVING ETHYLENICALLY UNSATURATED BOND

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

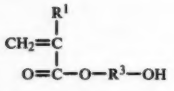
Filed Sep. 15, 1988, Ser. No. 244,347
Claims priority, application Japan, Sep. 16, 1987, 62-229492; Jun. 29, 1988, 63-159078
Int. Cl.[5] C08L *51/00, 47/00, 33/04;* **C08G** *63/48*
U.S. Cl. 522—31 **7 Claims**

1. A resin composition curable with an active energy ray comprising:

(i) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of alkyl methacrylates, acrylonitrile and styrene and has graft chains having structural units derived from at least one monomer selected from the group consisting of the monomers represented by the following formula I and other monomers presented by the formula II:



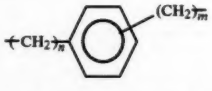
(I)



(II)

(wherein R^1 is hydrogen or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is hydrogen or an alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula:

(wherein $2 \leqq m+n \leqq 6$, $n \neq 0$ and $m \neq 0$), or a phenylalkyl group represented by the formula:



(wherein $2 \leqq m+n \leqq 4$, or the case where $n=0$ or $m=0$ is contained), added to said trunk chain;

(ii) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or more which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitile, isobornyl methacrylate, isobornyl acrylate, tricyclodecaneacrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate and other structural units derived from at least one monomer in amounts from 5 to 30 mole percent selected from the group consisting of the monomers represented by said formula (I) and the monomers represented by said formula (II);

(iii) an epoxy resin comprising at least one compound having two or more epoxy groups in one molecule in which part of the epoxy groups being esterificated with an unsaturated carboxylic acid; and

(iv) a monomer having an ethylenically unsaturated bond; and (v) a polymerization initiator capable of generating a Lewis acid by irradiation of an active energy ray.

5,068,258

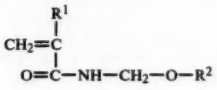
RESIN COMPOSITION CURABLE WITH AN ACTIVE ENERGY RAY CONTAINING HALF-ESTERIFICATED EPOXY RESIN AS A CONSTITUENT

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

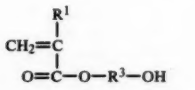
Filed Sep. 15, 1988, Ser. No. 244,868
Claims priority, application Japan, Sep. 16, 1987, 62-229492; Jun. 29, 1988, 63-159075
Int. Cl.[5] C08L *51/00, 33/04, 47/00;* **C08G** *63/48*
U.S. Cl. 522—31 **5 Claims**

1. A resin composition curable with an active energy ray comprising:

(i) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of alkyl methacrylates, acrylonitrile and styrene and has graft chains having structural units derived from at least one monomer selected from the group consisting of the monomers represented by the following formula I and other monomers presented by the formula II:

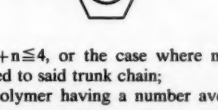


(I)



(II)

(wherein R^1 is hydrogen or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is hydrogen or an alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula: $-(CH_2)_n-O-(CH_2)_m$ (wherein $2 \leqq m+n \leqq 6$, $n \neq 0$ and $m \neq 0$), or a phenylalkyl group represented by the formula:



(wherein $2 \leqq m+n \leqq 4$, or the case where $n=0$ or $m=0$ is contained), added to said trunk chain;

(ii) a linear polymer having a number average molecular

weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or more which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitile, isobonnyl methacrylate, isobonnyl acrylate, tricyclodecaneacrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate and other structural units derived from at least one monomer in amounts from 5 to 30 mole percent selected from the group consisting of the monomers represented by said formula (I) and the monomers represented by said formula (II);

(iii) an epoxy resin comprising at least one compound having two or more epoxy groups in one molecule in which part of the epoxy groups being esterificated with an unsaturated carboxylic acid; and

(iv) a polymerization initiator capable of generating a Lewis acid by irradiation of an active energy ray.

5,068,259

RESIN COMPOSITION CURBABLE WITH AN ACTIVE ENERGY RAY CONTAINING EPOXY RESIN AND MONOMER WITH ETHYLENICALLY UNSATURATED BOND

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,303

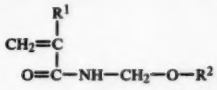
Claims priority, application Japan, Sep. 16, 1987, 62-229492; Jun. 29, 1988, 63-159077

Int. Cl.[5] **C08L** *51/00, 33/04, 47/00;* **C08G** *63/48*

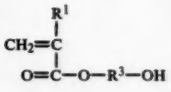
U.S. Cl. 522—31 **6 Claims**

1. A resin composition curable with an active energy ray comprising:

(i) a graft copolymerized polymer having a number molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of alkyl methacrylates, acrylonitrile and styrene and has graft chains having structural units derived from at least one monomer selected from the group consisting of the monomers represented by the following formula I and other monomers presented by the formula II:



(I)

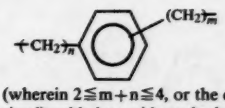


(II)

(wherein R^1 is hydrogen or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is hydrogen or an alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula:

$$-(CH_2)_n O-(CH_2)_m$$

(wherein $2 \leqq m+n \leqq 6$, $n \neq 0$ and $m \neq 0$), or a phenylalkyl group represented by the formula:



(wherein $2 \leqq m+n \leqq 4$, or the case where $n=0$ or $m=0$ is contained), added to said trunk chain;

(ii) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or more which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitile, isobornyl methacrylate, isobornyl acrylate, tricyclodecaneacrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate and other structural units derived from at least one monomer in amounts from 5 to 30 mole percent selected from the group consisting of the monomers represented by said formula (I) and the monomers represented by said formula (II);

(iii) an epoxy resin containing at least one compound having one or more epoxy groups in one molecule;

(iv) a monomer having

(v) a polymerization initiator capable of generating a Lewis acid by irradiation of an active energy ray.

5,068,260

RESIN COMPOSITION CURABLE WITH AN ACTIVE ENERGY RAY CONTAINING EPOXY RESIN CONTAINING AT LEAST A COMPOUND HAVING ONE OR MORE OF EPOXY GROUP IN THE MOLECULE

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,339

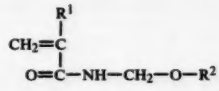
Claims priority, application Japan, Sep. 16, 1987, 62-229492; Jun. 29, 1988, 63-159074

Int. Cl.[5] **C08L** *51/00, 33/04, 47/00;* **C08G** *63/48*

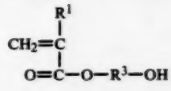
U.S. Cl. 522—31 **5 Claims**

1. A resin composition curable with an active energy ray comprising:

(i) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of alkyl methacrylates, acrylonitrile and styrene and has graft chains having structural units derived from at least one monomer selected from the group consisting of the monomers represented by the following formula I and other monomers presented by the formula II:



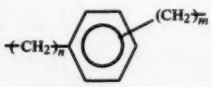
(I)



(II)

(wherein R^1 is hydrogen or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is hydrogen or an alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula: $-(CH_2)_n O-(CH_2)_m$ (wherein $2 \leqq m+n \leqq 6$, $n \neq 0$

and m≠0), or a phenylalkyl group represented by the formula:



(wherein 2≦m+n≦4, or the case where n=0 or m=0 is contained), added to said trunk chain; (ii) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or more which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitile, isobornyl methacrylate, isobornyl acrylate, tricyclodecaneacrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate and other structural units derived from at least one monomer in amounts from 5 to 30 mole percent selected from the group consisting of the monomers represented by said formula (I) and the monomers represented by said formula (II);

(iii) an epoxy resin containing at least one compound having one or more epoxy groups in one molecule: and

(iv) a polymerization initiator capable of generating a Lewis acid by irradiation of an active energy ray.

5,068,261

FLUORINE-CONTAINING EPOXY (METH) ACRYLATE RESIN WITH PHOTOINITIATOR

Tohru Maruno; Shigeki Ishibashi, both of Tokorozawa, and Kouzaburou Nakamura, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

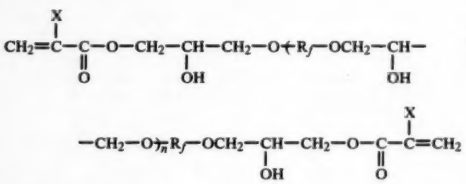
Continuation of Ser. No. 29,644, Aug. 24, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 332,381

Claims priority, application Japan, Mar. 24, 1986, 61-64000; May 13, 1986, 61-107675; Oct. 7, 1986, 61-237004; Oct. 17, 1986, 61-246849

Int. Cl.[5] **C08F** *2/50;* **C08G** *20/06*

U.S. Cl. 522—39 **2 Claims**

1. An adhesive composition comprising a fluorine-containing epoxy(meth)acrylate resin of the formula:



wherein R_f is a member selected from the group consisting of —ϕ—$C(CF_3)_2$—ϕ—, in which ϕ represents

and —$CH_2(CF_2)_6CH_2$—; O<n<0.2; and X is hydrogen or methyl, and from 2 to 10% by weight, based on the amount of said fluorine-containing epoxy(meth)acrylate resin, of a photopolymerization initiator which is a member selected from the group consisting of benzoin butyl ether, benzil dimethyl ketal, benzoin ethyl ether, benzophenone and Michler's ketone, the composition, when cured, having a refractive index n_D^{20} ranging from 1.434 to 1.532.

5,068,262

RESIN COMPOSITION CURABLE WITH AN ACTIVE ENERGY RAY CONTAINING PHOTOPOLYMERIZABLE POLYURETHANE

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,302

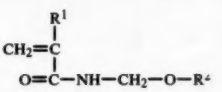
Claims priority, application Japan, Sep. 16, 1987, 62-229492; Jun. 29, 1988, 63-159079

Int. Cl.[5] **C08L** *51/00, 47/00, 33/04;* **C08G** *63/48*

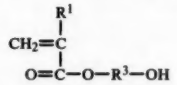
U.S. Cl. 522—95 **4 Claims**

1. A resin composition curable with an active energy ray comprising:

(i) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of alkyl methacrylates, acrylonitrile and styrene and has graft chains having- structural units derived from at least one monomer selected from the group consisting of the monomers represented by the following formula I and other monomers presented by the formula II:

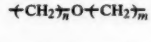


(I)

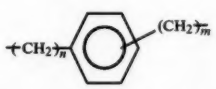


(II)

(wherein R^1 is hydrogen or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is hydrogen or an alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula:



(wherein 2≦m+n≦6, n≠0 and m≠0), or a phenylalkyl group represented by the formula:



(wherein 2≦m+n≦4, or the case where n=0 or m=0 is contained), added to said trunk chain;

(ii) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or more which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitrile, isobornyl methacrylate, isobornyl acrylate, tricyclodecaneacrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate and other structural units derived from at least one monomer in amounts from 5 to 30 mole percent

selected from the group consisting of the monomers represented by said formula (I) and the monomers represented by said formula (II);

(iii) an esterified polyurethane obtained from oligoesterdiol or from oligoesterdiol and dihydric isocyanate which has a molecular chain terminal end being esterified with acrylic acid: and

(iv) a photopolymerization initiator.

5,068,263

RESIN COMPOSITION CURABLE WITH AN ACTIVE ENERGY RAY CONTAINING GRAFT COPOLYMERIZED POLYMER WITH TRUNK CHAIN CONTAINING DICYCLOPENTENYL GROUP

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,301

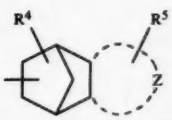
Claims priority, application Japan, Sep. 16, 1987, 62-229492; Jun. 29, 1988, 62-159076

Int. Cl.[5] C08L *51/00, 47/00, 33/04;* **C08G** *63/48*

U.S. Cl. 522—109 **4 Claims**

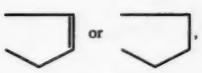
1. A resin composition curable with active energy ray, comprising:

(i) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less, which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of a monomer containing, in the molecule, a (meth)acryloyl group and a dicyclopentenyl derivative group represented by the general formula (I):

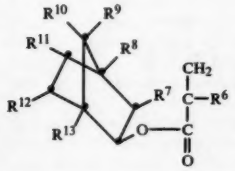


(I)

wherein Z represents a 5-membered ring shown by

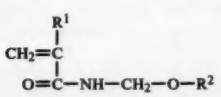


R^4 and R^5 each represents a hydrogen atom or an alkyl group with 1 to 3 carbon atoms, a monomer represented by the following general formula (II):



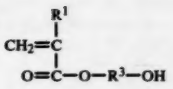
(II)

wherein R^6–R^{13} each represents a hydrogen atom or a methyl group, alkyl methacrylates, acrylonitrile and styrene and, added thereto, graft chains having structural units derived from at least one monomer selected from the group consisting of monomers represented by the following general formulae (x) and (y):



(x)

-continued

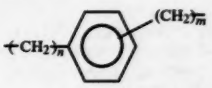


(y)

wherein R^1 is a hydrogen atom or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is a hydrogen atom or an alkyl or acrylic group having 1 to 4 carbon atoms which may have hydroxy groups, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula:

$$-CH_2)_nO-CH_2)_m$$

wherein $2 \leqq m+n \leqq 6$, $n \neq 0$, $m \neq 0$, or a phenylalkyl group represented by the formula:



wherein $2 \leqq m+n \leqq 4$, or the case wherein $n=0$ or $m=0$ is contained);

(ii) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or higher, which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitrile, isobornyl methacrylate, isobornyl acrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate, and structural units derived from at least one monomer in amounts from 5 to 30 mole percent selected from the group consisting of said monomers represented by the formula (x) and the the formula (y) described above;

(iii) a monomer having ethylenically unsaturated bond, and

(iv) a photopolymerization initiator capable of generating free radicals by irradiation of an active energy ray.

5,068,264

FORMYLPIPERAZINYL-(METH)ACRYLIC ACID DERIVATIVES FOR TREATMENT OF COLLAGEN

Michael Müller, Bergisch-Gladbach, and Wolfgang Podszun, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

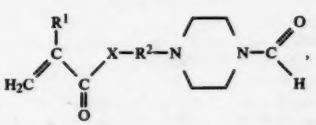
Filed Apr. 12, 1990, Ser. No. 509,000

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913940

Int. Cl.[5] A61K *6/00;* **A61L** *15/58;* **C07D** *241/04*

U.S. Cl. 522—167 **9 Claims**

1. An adhesive composition for the treatment of a collagen-containing material comprising a formylpiperazine group-containing (meth)acrylic acid derivative of the formula



(I)

in which

R^1 is hydrogen or methyl,

R^2 is a divalent aliphatic or cycloaliphatic radical, and
X is —O— or —NH—.
and an initiator, coactivator, carbonyl compound, filler, stabilizer, inhibitor, light screen, colorant, pigment or fluorescent substance.

5,068,265

SEALANT COMPOSITION

Tadhg E. Casey, and David P. Melody, both of Dublin, Ireland, assignors to Loctite (Ireland) Ltd., Dublin, Ireland

Filed Jul. 21, 1989, Ser. No. 384,230
Claims priority, application Ireland, Jul. 21, 1988, 2227/88
Int. Cl.[5] C09J *4/02*
U.S. Cl. 523—176 **18 Claims**

1. An improved anaerobically curable liquid (meth)acrylate ester sealant composition wherein the improvement comprises employing therein from about 0.1 to about 5% by weight of a fibrillated fibrous filler having a bulk density of less than about 25 lb. per cubic foot.

5,068,266

EMULSION WATER PAINT AND PROCESS FOR ITS PRODUCTION USING PHASE INVERSION OF EPOXY-ACRYLIC CURING AGENT RESIN COMPOSITION

Shunji Kojima, Yokosuka; Yoshiki Watanabe, Yokohama; Hiroaki Goto, Tokyo, and Toshinori Moriga, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 272,838, Sep. 27, 1988. This application Oct. 25, 1989, Ser. No. 426,351
Claims priority, application Japan, Jan. 27, 1987, 62-15146; Jan. 27, 1987, 62-15147; Mar. 25, 1987, 62-69176; May 7, 1987, 62-109727
Int. Cl.[5] C08G *59/40*; C09D *3/58, 3/81, 5/00*
U.S. Cl. 523—336 **9 Claims**

1. A process for the continuous production of an emulsion water paint, which comprises (1) in a first stage feeding (A) an organic solvent solution comprising a carboxyl group-containing acrylic resin component, an epoxy resin component and a component of a curing agent resin for the epoxy resin independently or in combination, together with (B) an aqueous solution of ammonia or an amine, to an in-line mixer, at an (A)/(B) weight mixing ratio of from 10/10 to 10/1, mixing the solution at a temperature of 10° to 90° C. under a pressure of 0.2 to 10 kg/cm^2 (gauge) to form a w/o emulsion, (2) in a second stage feeding the resulting w/o emulsion together with water in an amount of 30 to 100 parts by weight per 100 parts by weight of the w/o emulsion to an in-line mixer, mixing the w/o emulsion and water in the second mixer to effect a phase inversion to an o/w emulsion, and (3) withdrawing the formed o/w emulsion quantitatively.

5,068,267

SEMICONDUCTOR DEVICE ENCAPSULANT CONSISTING OF EPOXY RESIN COMPOSITION

Ken Uchida, Tokyo; Michiya Higashi, Kawasaki; Naoko Kihara, Matsudo; Hiroshi Shimozawa, and Akira Yoshizumo, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 12, 1989, Ser. No. 405,533
Claims priority, application Japan, Sep. 13, 1988, 63-229012
Int. Cl.[5] C08K *3/36*; C08G *63/91*
U.S. Cl. 523—435 **10 Claims**

1. A semiconductor device encapsulant consisting of an epoxy resin composition, comprising:
(a) an epoxy resin;
(b) a rubber-modified phenolic resin comprising a phenolic resin, and 0.1 to 7 wt. % of a graft copolymer of metharcylate and styrene onto a styrene-butadiene copolymer or butadiene polymer, and 0.1 to 5 wt. % of a thermosetting silicone rubber dispersed in said phenolic resin, where the total content of these modifiers is 0.2 to 10 wt. % with respect to the entire encapsulant,
(c) a curing accelerator; and
(d) 50 to 90 wt % of a silica powder with respect to the entire encapsulant,
where said rubber-modified phenolic resin and epoxy resin are mixed such that the equivalent weight ratio between a phenolic hydroxyl group and an epoxy group falls within the range of 0.5 to 1.5.

7. A rubber-modified phenolic resin comprising:
a phenolic resin; and
a graft copolymer of methylmethacrylate and styrene onto a butadiene polymer or styrene-butadiene copolymer and a thermosetting silicone rubber dispersed in the phenolic resin.

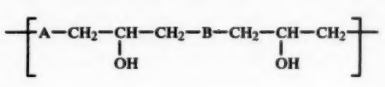
5,068,268

EPOXY POLYMER MATERIALS

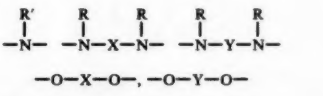
Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 12, 1989, Ser. No. 405,915
Int. Cl.[5] C08G *59/50*
U.S. Cl. 523—445 **19 Claims**

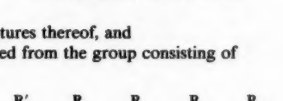
1. A polymer composition comprising lightly crosslinked linear molecules having the repeating structures prior to crosslinking of the formula



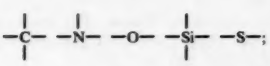
wherein
(a) A is selected from the group consisting of



and mixtures thereof, and
B is selected from the group consisting of



(b) each R is independently selected from the group consisting of unsubstituted or inertly substituted C_1–C_{20} aliphatic, cycloaliphatic or aralkyl groups; and each R′ is independently selected from the group of substituents used to define R plus unsubstituted and inertly substituted aryl groups;
(c) said repeating structures are lightly crosslinked such that between 2 and 25 of said repeating structures per 100 total repeating structures are crosslinked to repeating structures of other molecules;
(d) X and Y each independently is a segment comprising stiff units (SU and SU′, respectively) and optional flexible units (FU and FU′, respectively), which stiff units and flexible units are interconnected;
(e) said stiff units, SU and SU′, are independently selected from the groups consisting of unsubstituted and substituted monocyclic or fused two to four ring polycyclic aromatic groups consisting of benzene or fused benzene rings and non-interfering five or six number heterocyclic rings;
(f) said flexible units, FU and FU′, are independently selected from the group consisting of



and

(g) the ratio of the number of stiff units to flexible units in said X segment (SU/FU) is equal to or greater than the ratio of the number of stiff units to flexible units in said Y segment (SU'/FU'); and

(h) with the provision that about 50% or more of the total A and B groups in the polymer are internally non-rotating, planar segments derived from at least one of a dihydroxynaphthalene or a diglycidyl ether of a dihydroxynaphthalene.

5,068,269

CELLULOSIC MEMBRANES

Michael Diamantoglou, Erlenbach, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Aug. 31, 1990, Ser. No. 575,690

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929150

Int. Cl.[5] C08L *1/02*; B01D *39/04*

U.S. Cl. 524—35 **18 Claims**

1. A cellulose membrane comprising a mixture of cellulose and at least one compound of the formula

$$[A—B]_n$$

wherein A is at least one acidic or basic group;

B is a straight-chain or branched, substituted or unsubstituted group, and is selected from the group consisting of alkyl groups having at least 10 carbon atoms and arylalkyl groups having at least 10 carbon atoms, or a polymerizable substituted or unsubstituted monomeric group selected from the group consisting of alkene, alkyne, cycloolefin, arene, arylalkene, arylalkyne, allyl, and vinyl group, wherein the chain can be in errupted by heteroatoms selected from the group consisting of O, S, N, P, B, and Si;

n=1 or, in the case of polymerizable monomers, at least 10, and the percentage of cellulose in the mixture is at least 65%.

5,068,270

COMPOSITION FOR WATER PROOF SHEETS

Kazuyuki Isobe, Tokyo; Takao Aizawa, Yokohama; Noboru Yamaguchi, Yokohama, and Yutaka Ueda, Yokohama, all of Japan, assignors to Nippon Unicar Company Limited and Bridgestone Corporation, both of Danbury, Conn.

Continuation-in-part of Ser. No. 379,519, Jul. 13, 1989, abandoned. This application Dec. 27, 1989, Ser. No. 457,924

Int. Cl.[5] C08J *77/00*

U.S. Cl. 524—68 **6 Claims**

1. A composition for producing a water-proof sheet comprising 100 weight parts of a silicone-grafted linear ethylene-alpha-olefin copolymer prepared by adding an unsaturated alkoxysilane of the formula:

$$RR'SiY_2$$

wherein:

R is an aliphatically unsaturated hydrocarbon group or a hydrocarbonoxy group which is reactive with said free radicals generated in said copolymer;

Y is an alkoxy group and

R' is a monovalent hydrocarbon group having no olefin unsaturation;

and an organic peroxide to a linear ethylene-alpha-olefin copolymer containing at least 50% ethylene and said alpha olefin having 3–12 carbon atoms, said copolymer having a density equal to or less than 0.910 g/ml; 20–200 weight parts of asphalt and 0.01 to 10 weight parts of a silanol-condensation catalyst.

5,068,271

ARYLENEDIAMINE SUBSTITUTED PYRIMIDINES COMPOSITIONS

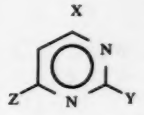
Edward L. Wheeler, Watertown; Franklin H. Barrows, Naugatuck, and Robert J. Franko, Beacon Falls, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 247,143, Sep. 21, 1988, Pat. No. 4,946,956. This application Jul. 30, 1990, Ser. No. 559,768

Int. Cl.[5] C08K *5/3492*

U.S. Cl. 524—100 **2 Claims**

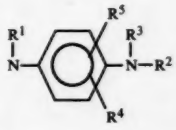
1. A degradation resistant composition comprising an unsaturated polymer and an antidegradant amount of a compound of Structure (I):



(I)

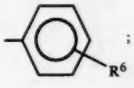
in which

X is



R^1 is hydrogen,
C_1–C_{11} alkyl,
C_3–C_6 cycloalkyl,
phenyl or
phenyl substituted with C_1–C_4 alkyl or phenyl;

R^2 is
C_1–C_{11} alkyl,
C_3–C_6 cycloalkyl or



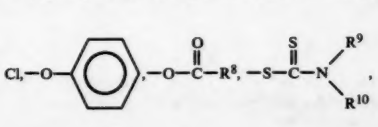
R^3 is hydrogen,
phenyl or
C_1–C_{11} alkyl when R^1 is hydrogen;

R^4 is hydrogen or
C_1–C_8 alkyl;

R^5 is hydrogen or
C_1–C_8 alkyl;

R^6 is hydrogen,
C_1–C_{11} alkyl or
C_1–C_4 alkoxy

Y is X, hydrogen, C_1–C_4 alkyl, —SH, SR^7, —OH, OR^7,



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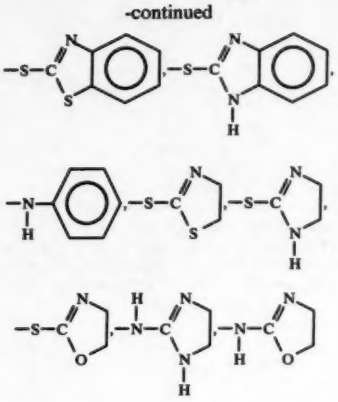
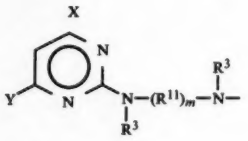


R^7 is C_1–C_{12};
R^8 is C_1–C_{11};
R^9 and R^{10} are C_1–C_4 alkyl
Z=X or Y or



R^{11} is
C_2–C_{10} linear alkyl;
C_5–C_{10} cycloalkyl or C_7–C_9 phenylalkyl;
m is 2–6
If Y≠X then R_6 can be hydrogen.

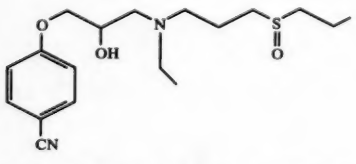
5,068,272

NOVEL POLYSTYRENESULFONATE, USEFUL AGAINST CARDIAC ARRHYTHMIAS

Kjell H. Andersson, Fjärås, Sweden, assignor to Aktiebolaget Hassle, Molndal, Sweden

Filed Jun. 18, 1990, Ser. No. 539,863
Claims priority, application Sweden, Jun. 29, 1989, 8902236
Int. Cl.[5] C08K *5/41;* **C08J** *3/00;* **C07C** *255/50*
U.S. Cl. 524—155 **11 Claims**

1. The salt of the compound 4-[3-[ethyl[3-(propylsulfinyl)-propyl]amino]-2-hydroxypropoxy]-benzonitrile having the formula I



(I)

with polystyrenesulfonic acid, said compound being in the form of the stereoisomeric mixture or in the form of a pure stereoisomer thereof.

5,068,273

THERMOSETTING COMPOSITION

Narendra M. Patel, Mount Pocono, Pa., and Leonard Di Leo, Belleville, N.J., assignors to Sun Chemical Corporation, Fort Lee, N.J.

Filed Jun. 27, 1990, Ser. No. 545,440
Int. Cl.[5] C08L *61/28;* **C08K** *5/42*
U.S. Cl. 524—166 **10 Claims**

1. A thermosetting composition comprising:
(a) a mixture of at least one thermosettable polyester and an aminoplast resin; and
(b) at least one alkali metal organosulfonate as a catalyst for curing said mixture.

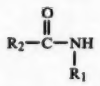
5,068,274

SECONDARY AMIDES IN POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITIONS

Howard F. Efner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 19, 1990, Ser. No. 544,498
Int. Cl.[5] C08K *5/20*
U.S. Cl. 524—230 **70 Claims**

1. A composition comprising:
(a) about 30 to about 90 weight percent, based on the total weight of the composition polyethylene terephthalate;
(b) about 5 to about 65 weight percent based on the total weight of the composition filler;
(c) about 0.5 to 15 parts per hundred parts of (a) a normally liquid aliphatic polyester having a number average molecular weight in the range from about 7,500 to about 20,000 and which is a condensation product of an alkanedioic acid containing from 8 to about 12 carbon atoms per molecule and an alkanediol containing from 2 to about 5 carbon atoms per molecule;
(d) about 0.1 to about 3 parts per hundred parts of (a) a metal salt of an ionic hydrocarbon copolymer of an alpha-olefin containing from 2 to about 5 carbon atoms per molecule and an alpha,beta-ethylenically unsaturated carboxylic acid containing from 3 to about 5 carbon atoms per molecule in which copolymer the neutralized anionic carboxyl groups are associated with cations of said metal, said copolymer having a number average molecular weight in excess of about 3,000 prior to neutralization, said metal being selected from the group consisting of sodium and potassium;
(e) about 0.01 to 2 parts per hundred parts of (a) an antioxidant;
(f) about 0.1 to about 5 parts per hundred parts of (a) a secondary amide described by the formula:



wherein R_1 and R_2 may be the same or different and represent alkyl groups or unsaturated aliphatic groups containing from 8 to 36 carbon atoms, and wherein each said unsaturated group can have up to three double bonds.

5,068,275

PLASTICIZED HYDROGENATED NITRILE RUBBER

William A. Wiseman, Sarnia, Canada, assignor to Polysar Rubber Corporation, Sarnia, Canada

Continuation-in-part of Ser. No. 473,437, Feb. 1, 1990, abandoned. This application Oct. 5, 1990, Ser. No. 593,743
Int. Cl.[5] C08K *5/11*
U.S. Cl. 524—314 **4 Claims**

1. A vulcanized rubber composition having improved low temperature characteristics and improved resistance to hot air ageing, said composition containing as the only rubbery polymer hydrogenated nitrile rubber and further comprising a

peroxide vulcanization system containing from 2 to 14 parts by weight of organic peroxide per 100 parts by weight of said hydrogenated nitrile rubber and from 10 to 30 parts by weight per 100 parts by weight of said hydrogenated nitrile rubber of a polymeric plasticizer having a weight average molecular weight of from about 600 to about 1500 and being a mixed dibasic acid polyester polymeric plasticizer obtained by the reaction of a dicarboxylic acid with a C_1 to C_{12} alcohol.

5,068,276

CHEMICALLY AGGREGATED MINERAL PIGMENTS

Paul R. Suitch, Milledgeville; A. Taylor Coppage, Macon, and Alan J. Brown, Milledgeville, all of Ga., assignors to E.C.C. America Inc., Atlanta, Ga.

Filed Dec. 29, 1989, Ser. No. 459,093
Int. Cl.[5] C08J *3/14*
U.S. Cl. 524—413 **16 Claims**

1. A process for forming chemically aggregated bulking pigments for use in paper filling and coating formulations, which comprises forming an aqueous slurry of a feed material comprising negatively charged mineral particles which have acid to neutral pH characteristics; adding a source of a polyvalent cation to said slurry to floc the said particles; adding polyacrylic acid to an acidic pH and neutralizing with a base to an alkaline pH to cross-link the polyacrylic acid with the polyvalent cation to cause the polyacrylate salt of said cation to precipitate in situ on the mineral particle flocs to thereby form aggregates having a bulked, porous, floc structure; and recovering and drying the aggregates as product.

5,068,277

HYDROLYZABLE SILICONE POLYMERS

Rastko Vukov, Toronto, and Basil A. Behnam, Oakville, both of Canada, assignors to Rhone-Poulenc Inc., Princeton, N.J.

Filed May 3, 1989, Ser. No. 346,869
Int. Cl.[5] C08K *3/08*
U.S. Cl. 524—441 **27 Claims**

1. A hydrolyzable silicon containing polymer having the formula

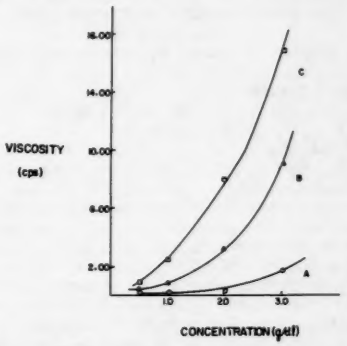
wherein R_2 and R_3 are each independently alkyl or aryl optionally substituted with lower alkyl;
Z_1 is $—CH_2CHA—(CH_2)_rSi(R_1)_3$;
Z and Z_2 are each independently $(R_9)_nSi(H)_{3-n}$;
n has a value of from 0 to 3;
R_9 is slkyl, alkoxy, phenoxy, or aryl optionally substituted with lower alkyl;
R_7 is R_2;
x has a value of from 2 to 1000;
y has a value of from 1 to 200;
A is hydrogen, alkyl or phenyl;
r has a value of from 0 to 12; and
R_1 is hydroxy, acyloxy, halogen, amino, alkoxy, aryloxy or aryloxy substituted with lower alkyl, halogen or acyloxy.

5,068,278

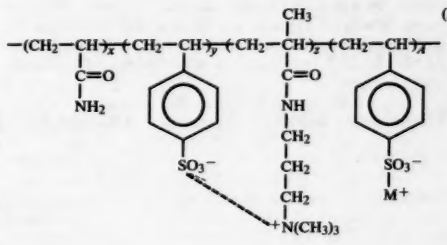
NOVEL POLYAMPHOLYTE COMPOSITIONS POSSESSING HIGH DEGREES OF ACID, BASE, OR SALT TOLERANCE IN SOLUTION

Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

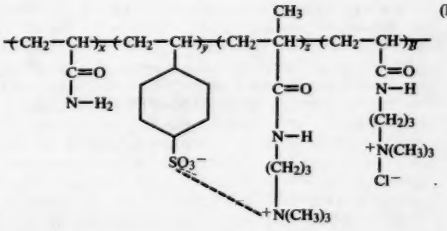
Continuation of Ser. No. 288,888, Dec. 23, 1988, Pat. No. 4,946,916, which is a division of Ser. No. 81,682, Aug. 5, 1987, Pat. No. 4,837,288, which is a division of Ser. No. 826,229, Feb. 5, 1986, Pat. No. 4,710,555, which is a continuation-in-part of Ser. No. 688,238, Jan. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 560,543, Dec. 12, 1983, abandoned. This application Jun. 6, 1990, Ser. No. 533,750
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.[5] C08K *3/16*
U.S. Cl. 524—547 **9 Claims**



1. A composition containing from about 0.001 to about 20 grams of a terpolymer per 100 grams of water dissolved in a medium selected from the group consisting of water, a salt solution, an acid solution, or a basic solution, said terpolymer having a minor amount of a non-polymerizable free charge and having the formula:



or



5,068,279

LOW FREE FORMALDEHYDE MELAMINE-FORMALDEHYDE DETACKIFIER AND METHOD OF USING

Lewis D. Morse, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 296,258, Jan. 12, 1989, Pat. No. 4,935,149. This application Mar. 30, 1990, Ser. No. 501,466

Int. Cl.[5] C01L *61/24*

U.S. Cl. 524—593 **4 Claims**

1. A melamine-formaldehyde detackifier composition comprising a melamine-formaldehyde polymer and a formaldehyde scavenging agent comprising urea and at least one enhancer selected from the group consisting of glyoxal and acetylacetone, the formaldehyde scavenging agent being included in an amount sufficient to reduce the free formaldehyde in the detackifier composition to less than 0.15%.

5,068,280

POLYURETHANE AND/OR POLYUREA DISPERSIONS IN ACTIVE HYDROGEN-CONTAINING COMPOSITIONS

Jack M. Pal; James P. Cosman, both of Sarnia, and Karen Tan, Kingston, all of Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 12, 1989, Ser. No. 406,000

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—728 **23 Claims**

1. A dispersion of polyurethane and/or polyurea particles in an isocyanate-reactive material having an equivalent weight greater than 400, wherein said particles have a bimodal particle size distribution wherein at least about 60 volume percent of the particles fall into two discrete size ranges, about 5 to about 75 volume percent of said particles in said discrete size ranges, being larger particles having an average particle size, as measured by hydrodynamic chromatography (HDC), of at least about 2000, and about 25 to about 95 volume percent of the particles in said discrete size ranges being smaller particles having an average particle size, as measured by HDC, of about 100 to about 7000 Angstroms.

5,068,281

PROCESS FOR THE PRODUCTION OF MOLDED ARTICLE OF FIBER-REINFORCED THERMOSETTING RESIN, AND MATERIALS THEREFOR

Hiroyuki Okumura, Hiratsuka; Masashi Kurokawa, Hatano; Akira Namikawa, Fujisawa, and Hiroka Tanisake, Hiratsuka, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi and A.G. International Chemical Company, Inc., Tokyo, both of, Japan

Filed Apr. 3, 1990, Ser. No. 504,137

Claims priority, application Japan, Apr. 3, 1989, 1-81400

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—753 **20 Claims**

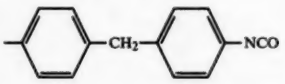
1. A process for the production of a molded article of a thermosetting resin composition by injection of a raw material component mixture containing an active hydrogen compound (A) with a polymerizable vinyl monomer (B) and a raw material component containing a polyisocyanate compound (C) into a mold charged with a fiber (D), wherein:

(1) the active hydrogen compound (A) is formed by mixing an unsaturated polyester (a_1) produced from a dicarboxylic acid containing 40 to 100 mole % of an unsaturated dicarboxylic acid or an anhydride thereof and a polyhydric alcohol containing a primary hydroxyl group and having a hydroxyl value of 110 to 280 mgKOH/g and an acid value of not more than 5 mgKOH/g with at least one member selected from the group consisting of an unsaturated epoxy ester (a_2) produced from an epoxy compound having at least one epoxy group in the molecule and an epoxy equivalent of 70 to 200 and a polymerizable unsaturated monobasic acid and an acrylic compound (a_3) having an acryloyl group and an hydroxyl group in the molecule, and (a_1), (a_2) and (a_3) have a mixing ratio satisfying the equation of

$$(a_2+a_3) / (a_1+a_2+a_3)\times 100=1 \text{ to } 15 \text{ wt \%},$$

(2) the polymerizable vinyl monomer (B) is a monomer containing 5 to 40% by weight of methyl methacrylate, and

(3) the polyisocyanate compound (C) is a liquid compound having a terminal group of



and a viscosity, at 25° C., of 10 to 2,000 cps,

the process being carried out under the following conditions (i), (ii) and (iii);

(i) (B) is 20 to 50% by weight in amount based on the total amount of (A) and (B),

(ii) (C) has an isocyanate group which is 0.75 to 1.2 times, preferably 0.85 to 1.1 times, by mole, the amount of the hydroxyl group of (A), and

(iii) (D) is 30 to 75% by weight based on the total amount of (A), (B), (C) and (D).

5,068,282

PROCESS FOR PRODUCING A POLYVINYL ACETACETAL RESIN FOR USE IN A HEAT TRANSFER SHEET

Jumpei Kanto, Komae; Masanori Akada; Katsuhiro Kamakari, both of Tokyo; Kenichi Asahina; Katsuaki Sakashita, both of Shiga, and Yoshihisa Watanabe, Uji, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan and Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 132,001, Dec. 11, 1987, Pat. No. 4,902,670. This application Oct. 30, 1989, Ser. No. 428,619

Claims priority, application Japan, Dec. 15, 1986, 61-298505; Feb. 27, 1987, 62-45463

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—61 **6 Claims**

1. A process for producing a polyvinyl acetacetal resin, sequentially comprising the steps of:

initiating precipitation of an acetalated product by maintaining an emulsifier-free reaction system comprising a polyvinyl alcohol and acetaldehyde in an aqueous phase in the presence of 4–10% by weight of an acid catalyst in a first temperature range of 8°–17° C. for at least 30 minutes; and

maintaining the reaction system in a second temperature range of 25°–40° C. to obtain the polyvinyl acetacetal resin.

5,068,283

METHOD FOR PRODUCING THERMOPLASTIC RESIN COMPOSITION

Tadayuki Ohmae; Yoshiki Toyoshima; Kentaro Mashita, and Jinsho Nambu, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 157,262, Feb. 18, 1988, abandoned. This application Mar. 12, 1990, Ser. No. 492,471

Claims priority, application Japan, Mar. 31, 1987, 62-80786

Int. Cl.[5] C08L *67/02*

U.S. Cl. 525—64 **1 Claim**

1. A method for producing a thermoplastic resin composition which comprises:

melt-kneading (A) 60–97 parts by weight of a saturated polyester resin and (B) 40–3 parts by weight of an epoxy group-containing ethylene copolymer which comprises:

(i) 30–99% by weight of an ethylene unit,

(ii) 20-1% by weight of an α,β-unsaturated carboxylic acid glycidyl ester unit, and

(iii) 70-0% by weight of an ester unit selected from the group consisting of carboxylic acid vinyl ester and α,β-unsaturated carboxylic acid alkyl ester, and then

melt-kneading the resulting composition with (C) 0.01-20 parts by weight of an ethylene copolymer comprising an ethylene unit and an α,β-unsaturated carboxylic acid N,N-dimethylaminoalkyl ester unit, or an ethylene unit and a N,N-dimethylaminoalkyl α,β-unsaturated carboxylic acid amide unit to carry out a partial crosslinking reaction.

5,068,284

BLOCKED AMINE TERMINATED POLYCARBONATES AND PRODUCTS OBTAINED THEREFROM

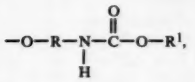
Timothy J. Ullman, Voorheesville, and Ronald J. Gambale, Croton-On-Hudson, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1990, Ser. No. 562,354

Int. Cl.[5] C08G *64/14, 64/18;* **C08L** *69/00*

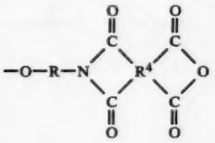
U.S. Cl. 525—67 **13 Claims**

1. A polycarbonate having terminal groups of the formula,



where R is a $C_{(2-13)}$ divalent organo radical, and R^1 is $C_{(3-8)}$ branched alkyl radical.

4. A polycarbonate having terminal groups of the formula,



where R is a $C_{(2-13)}$ divalent organo radical and R^4 is a tetravalent $C_{(2-30)}$ aromatic organic radical.

5,068,285

MOLDING COMPOSITIONS WITH ACRYLONITRILE-STYRENE-ACRYLATE RUBBER COPOLYMERS

Michael K. Laughner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 320,667, Mar. 8, 1989, abandoned. This application Sep. 22, 1989, Ser. No. 411,278

Int. Cl.[5] C08L *69/00;* **B29C** *49/00, 51/00*

U.S. Cl. 525—67 **15 Claims**

1. A moldable composition consisting essentially of

A) about 20 to about 95% by weight of a carbonate polymer selected from the group consisting of

(i) randomly branched carbonate polymers,

(ii) linear carbonate polymers, and

(iii) blends of randomly branched carbonate polymers with linear carbonate polymers,

B) about 5 to about 75% by weight of a vinyl cyanide-vinyl aromatic hydrocarbon-acrylate rubber copolymer, and

C) about 0.5 to about 20% by weight of a core-shell graft copolymer having a butadiene polymer core and having an outer shell of a polymer selected from the group consisting of polymerized alkyl methacrylate and polymerized alkyl acrylate

wherein at least part of the core-shell graft copolymer is located in the carbonate polymer phase or in the interface between the carbonate phase and the vinyl cyanide-vinyl aromatic hydrocarbon-acrylate rubber copolymer.

5,068,286

COPOLYMERS FROM NUCLEOPHILIC OLEFIN POLYMERS AND EPOXYTRIAZINE-CAPPED POLYPHENYLENE ETHERS

John R. Campbell, Clifton Park; Timothy J. Shea, Schenectady; Stanley Y. Hobbs, Scotia, and Sterling B. Brown, Schenectady, all of N.Y., assignors to GE Plastics Japan Ltd., Japan

Filed Feb. 27, 1989, Ser. No. 316,059

Int. Cl.[5] C05L *53/02, 71/12*

U.S. Cl. 525—92 **23 Claims**

1. A composition comprising copolymers prepared by the reaction of a polyphenylene ether containing epoxytriazine groups with at least one aliphatic olefin polymer containing highly nucleophilic substituents.

5,068,287

PRIMER COMPOSITIONS

Shosaku Yamamoto, and Kazuo Kakinuma, both of Yokohama, Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan

Division of Ser. No. 197,149, May 23, 1988, Pat. No. 4,985,500, which is a continuation of Ser. No. 3,238, Jan. 14, 1987, Pat. No. 4,830,778. This application Nov. 9, 1990, Ser. No. 611,775

Claims priority, application Japan, Jan. 23, 1986, 61-11152

Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—124 **5 Claims**

1. A primer composition consisting essentially of

(A) at least one resin having a glass transition temperature of not higher than −20° C. and an elongation at break of not less than 400% at 20° C., and being an ethylene-vinyl acetate copolymer or a chlorinated ethylene-vinyl acetate copolymer resin or a modified resin thereof comprising high molecular weight elastomers and

(B) at least one cross-linking resin selected from the group consisting of melamine resin, urea resin, polyisocyanate resin, blocked isocyanate resin and polyurethane resin,

wherein the weight ratio as a solid resin content of component (A) to component (B) is 70-99:30-1.

5,068,288

ACID ETCH RESISTANT CLEAR COATS

Dennis N. Taljan, North Ridgeville, and R. Douglas Price, North Royalton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 31, 1990, Ser. No. 531,380

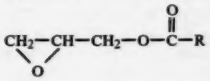
Int. Cl.[5] C08L *63/00*

U.S. Cl. 525—155 **12 Claims**

1. A curable composition comprising blends of active hydrogen-containing polymers and a curing agent therefor comprising:

(A) 5 to 60 percent by weight of a free radical initiated addition polymer prepared from a mixture of monomers comprising:

(1) an epoxy monomer represented by the formula:



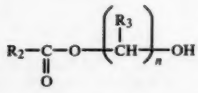
where R stands for a tertiary aliphatic hydrocarbon group having 4 to 26 carbon atoms,

(2) a polymerizable alpha, beta-ethylenically unsaturated carboxylic acid, and

(3) optionally at least one other polymerizable alpha, beta-ethylenically unsaturated monomer;

(B) 10 to 50 percent by weight based on weight of resin solids of an acrylic copolymer different than (A) prepared from a mixture of monomers comprising:

(1) a monomer of the formula:



wherein R_2 is a polymerizable unsaturated hydrocarbon group, R_3 is hydrogen or C_1 to C_4 alkyl, n=2 to 4 and

(2) at least one other unsaturated monomer copolymerizable therewith;

(C) 30 to 50 percent by weight based on weight of resin solids of a curing agent reactive with (A) and (B);

the percentages by weight being based on total weight of (A), (B) and (C).

5,068,289

REINFORCED POLYMER COMPOSITIONS

Eric R. George, and William P. Gergen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 6, 1989, Ser. No. 432,010

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.[5] C08L *77/06*

U.S. Cl. 525—179 **18 Claims**

1. A glass fiber reinforced blend which comprises (a) a major proportion of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, (b) a polymeric polyamide having recurring amide groups in the polymeric chain and (c) an acidic polymer containing moieties of an α-olefin, an α,β-ethylenically unsaturated carboxylic acid and as an optional monomer a non-acidic low molecular weight polymerizable monomer, a portion of the acid groups of the acidic polymer optionally neutralized with non-alkali metal, the glass being present in an amount of from about 1% by weight to about 45% by weight based on total blend.

5,068,290

PROCESS FOR THE CHLORINATION OF POLYOLEFINS

Hee-Dong Kang, Building 308-906, Shinbanpo 8th Apt., 112, Jamwon-dong, Sucho-ku, Seoul, Rep. of Korea

Filed Apr. 30, 1990, Ser. No. 516,730

Claims priority, application Rep. of Korea, May 6, 1989, 6080/89[U]

Int. Cl.[5] C08F *8/22*

U.S. Cl. 525—192 **16 Claims**

1. A process for the chlorination of polyolefins which comprises mixing a finely divided polyolefin with an anti-coagulant selected from the group consisting of titania, talc, silica, and polystryene sulfide, and then subjecting the mixture to a multi-step chlorination in bulk in the presence of a free radical generation accelerant.

5,068,291

METHOD OF PREPARING PRESSURE SENSITIVE ADHESIVES WITH ACCELERATED CURE RATE

George L. Gallaway, Asbury, and Paul B. Foreman, Somerville, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Mar. 22, 1990, Ser. No. 498,199

Int. Cl.[5] C08F *8/42*

U.S. Cl. 525—366 **12 Claims**

1. In a method of preparing a pressure sensitive adhesive by reacting:

(A) a normally tacky interpolymer of:

(1) at least about 40 percent by weight of one or more alkyl acrylates having about 1 to 18 carbon atoms in the alkyl group,

(2) from about 0.2 to 20 percent by weight of an ethylenically unsaturated monomer containing one or more carboxylic acid groups, and

(3) from about 5 to 59.8 percent by weight of vinyl acetate, and

(B) a chelated metal alkoxide having the formula $R_nT(OR_1)_z$ wherein T is a metal selected from the group consisting of Groups II, III, IV and V and the transition metals of the Periodic Table, R is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms and aryl radicals of from 6 to 16 carbon atoms, R_1 is selected from the group consisting of aliphatic and substituted aliphatic radicals containing from 1 to 18 carbon atoms, n is an integer whose value is 0 or greater and z is an integer whose value is at least 2 wherein the sum of n+z is greater than 1 and is equal to the valence of the metal represented by T,

the improvement comprising providing a pressure sensitive adhesive having a fast curing rate by first forming the interpolymer by the slow addition of a uniform mixture of all the (A) components including the slower reacting vinyl acetate and the faster reacting alkyl acrylate and ethylenically unsaturated carboxylic acid containing monomer to the reaction kettle.

5,068,292

IN-SITU COMPOSITES

Gerd M. Lenke, Canton, and Donald R. Wiff, Akron, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Filed Jul. 11, 1989, Ser. No. 377,987

Int. Cl.[5] C08L *61/20*

U.S. Cl. 525—509 **15 Claims**

1. A method of preparing an in situ composite material comprising:

a. dissolving precursors to a rigid rod polymer in precursors to a matrix polymer; and

b. reacting said precursors to the rigid rod polymer to form the rigid rod polymer in situ; and

c. reacting said precursors to the matrix polymer to form the matrix polymer in situ.

5,068,293

NAPHTHOL-BASED EPOXY RESINS, INTERMEDIATES FOR THE SAME, PROCESS FOR PREPARING THE SAME, AND EPOXY RESIN COMPOSITIONS CONTAINING THE SAME

Masashi Kaji, Kitakyushu; Takanori Aramaki, Fukuoka; Norito Nakahara, and Yasuharu Yamada, both of Kitakyushu, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

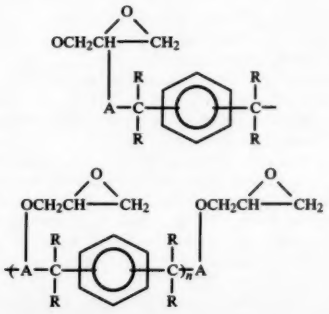
Filed Aug. 30, 1990, Ser. No. 575,022

Claims priority, application Japan, Sep. 1, 1989, 1-224520

Int. Cl.[5] C08G *59/00, 65/08, 65/14*

U.S. Cl. 525—534 **2 Claims**

1. Naphthol-based epoxy resins of the general formula (I)



in which A is a naphthalene nucleus, R is hydrogen or methyl, and n is an integer from 0 to 15.

5,068,294

PROCESS TO PRODUCE POLYMERS OF STYRENE DERIVATIVES

Donn A. DuBois, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 28, 1990, Ser. No. 589,363
Int. Cl.[5] C08F *2/06, 4/16, 12/08*
U.S. Cl. 526—194 **26 Claims**

1. A process for producing a polymer comprising the step of contacting a monomer selected from the group of styrene and styrene derivatives with a zeolite and an iodine containing electrophile under conditions which result in polymerizing the monomers.

5,068,295

WATER AND OIL REPELLANTS

Iwao Misaizu, Urawa; Kazuyuki Hanada, Washinomiya; Akihiko Shibuya, Tokyo, and Katsumi Kuriyama, Koshigaya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 477,485
Claims priority, application Japan, Feb. 15, 1989, 1-33748; Feb. 15, 1989, 1-33749
Int. Cl.[5] C08F *18/20*
U.S. Cl. 526—245 **11 Claims**

1. A water and oil repellant, comprising a copolymer of a first vinyl monomer having a perfluoroalkyl group, a second vinyl monomer having a polyorganosiloxane chain and a third vinyl monomer having an isocyanate group or a block isocyanate group as essential components, said vinyl monomer having an isocyanate group being selected from the group consisting of methacryl isocyanate, m-isopropenyl-α,α-dimethyl isocyanate and a compound formed by reacting any of 2-hydroxyethyl (meth)acrylates, 2-hydroxypropyl (meth)acrylates, glycerol mono(meth)acrylates, 1,6-hexanediol mono(meth)acrylates, neopentyl glycol mono(meth)acrylates, trimethylolpropane mono(meth)acrylates, pentaerythritol mono(meth)acrylates, diethyleneglycol mono(meth)acrylates, polyethyleneglycol mono(meth)acrylates, polypropyleneglycol mono(meth)acrylates, t-butylaminoethyl (meth)acrylates and polyethyleneglycol polypropyleneglycol (meth)acrylates with any one of 4,4'-diphenylmethane diisocyante, 4,4'-dicyclohexylmethane diisocyanate, isophorone, diisocyanate, xylylene diisocyanate, tolylene diisocyanate, phenylene diisocyanate, hexamethylene diisocyanate, and 1,5-naphthylene diisocyanate; said block isocyanate group being any one of the above isocyanate groups blocked with a blocking agent.

5,068,296

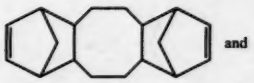
METATHESIS POLYMERIZED CROSS-LINKED COPOLYMER

Shigeyoshi Hara; Zen-ichiro Endo, and Hiroshi Mera, all of Iwakuni, Japan, assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 155,798, Feb. 16, 1988, Pat. No. 5,006,616. This application Feb. 25, 1991, Ser. No. 644,664
Claims priority, application Japan, Feb. 16, 1987, 62-31495
Int. Cl.[5] C08F *232/08*
U.S. Cl. 526—282 **38 Claims**

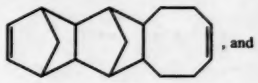
1. A metathesis polymerized cross-linked copolymer comprising:

(a) 3–100 mole % of repeating units derived from a mixture comprising the following monomers:



and

(I-a)



, and

(I-b)

(b) 97–0 mole % of repeating units derived from at least one of metathesis polymerizable cyclic compounds.

5,068,297

HYDROPHOBIC CATIONIC TERPOLYMERS FROM ACRYLAMIDE, UNSATURATED QUATERNARY SALT AND VINYL ACETATE

Bhupati R. Bhattacharyya, Downers Grove, and Michael R. St. John, Chicago, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 26, 1989, Ser. No. 427,454
Int. Cl.[5] C08F *220/56*
U.S. Cl. 526—287 **10 Claims**

1. A hydrophobic cationic terpolymer of (a) at least one monomer selected from the group consisting of acrylamide and methacrylamide, (b) at least one monomer selected from the group consisting of dimethylaminoethymethacrylate methyl chloride and dimethylaminoethylmethacrylate methyl sulfate, and (c) a vinyl acetate monomer, the mole % of said (a), (b), and (c) monomers being in the range of from 30 to about 85 for the (a) monomer, from about 5 to about 26 for the (c) monomer, and the balance for the (b) monomer.

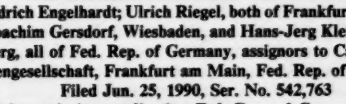
5,068,298

ALKENYL-PHOSPHONIC AND -PHOSPHINIC ESTERS, PROCESS FOR THEIR PREPARATION, THEIR USE AND HYDROGELS PREPARED USING THEM

Friedrich Engelhardt; Ulrich Riegel, both of Frankfurt am Main; Joachim Gersdorf, Wiesbaden, and Hans-Jerg Kleiner, Kronberg, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 25, 1990, Ser. No. 542,763
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922327
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] C08F *230/04, 230/02*
U.S. Cl. 526—240 **4 Claims**

1. Water-swellable hydrogel prepared by copolymerization of ethylenically unsaturated hydrophilic monomers, characterized in that the compounds of the formula I



(I)

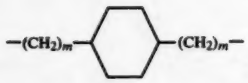
in which

R^1 and $R^{1'}$, independently of one another, are hydrogen or $(C_1–C_4)$-alkyl,

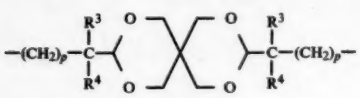
R^2 is $(C_1–C_4)$-alkyl,

n is 0 or 1 and

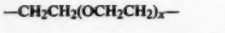
A is straight-chain or branched $(C_2–C_{12})$-alkylene or a group of the formula II


(II)

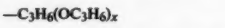
in which m is 0 or 1, or a group of the formula III


(III)

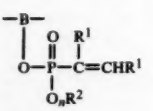
in which R^3 and R^4, independently of one another, are (C_1–C_4)alkyl and p is 0 or 1, or a group of the formula IV


(IV)

in which x is 1 to 12 or a group of the formula V


(V)

in which x is 1 to 12 or a group of the formula VI


(VI)

in which B represents straight-chain or branched (C_3–C_{12})-alkylene and R^1, $R^{1'}$, R^2 and n are as defined above,

are employed as cross-linking agents during the copolymerization.

5,068,299

CARBODOHYDRATE-MODIFED POLYPHENOL COMPOUNDS AND COMPOSITIONS CONTAINING THEM

Andreas Lindert, Troy; John R. Pierce, Huntington Woods; David R. McCormick, Madison Heights, and William D. Zimmermann, Farmington Hills, all of Mich., assignors to Henkel Corporation, Ambler, Pa.

Division of Ser. No. 128,673, Dec. 4, 1981, Pat. No. 4,863,596. This application Aug. 24, 1990, Ser. No. 573,412

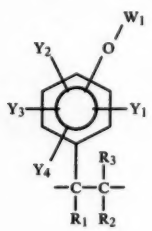
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

Int. Cl.[5] C08F *12/24*

U.S. Cl. 526—313 **18 Claims**

1. A homo- or co-polymer compound comprising at least one polymer selected from the group consisting of (a), (b), (c), or (d), wherein:

(a) comprises a polymer material having at least one unit having the formula:

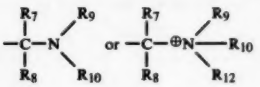


wherein:

R_1 through R_3 are independently selected for each of said units from the group consisting of hydrogen, an alkyl group having from 1 to about 5 carbon atoms, or an aryl group having about 6 to about 18 carbon atoms;

Y_1 through Y_4 are independently selected for each of said units from the group consisting of hydrogen, —CR_{11}-R_5OR_6, —CH_2Cl, or an alkyl or aryl group having from 1 to 18 carbon atoms or Z;

Z is



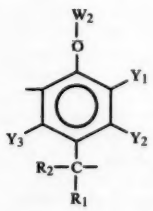
however, at least a fraction of the Y_1, Y_2, Y_3 or Y_4 of the homo- or copolymer compound or material must be Z and at least a fraction of said Z must contain a polyhydroxy alkyl-amine functionality resulting from the condensation of an amine or NH_3 and a ketose, aldose or other alkylaminopolyhydroxy compound having from about 3 to about 8 carbon atoms;

R_5 through R_{12} are independently selected for each of said units from the group consisting of hydrogen, an alkyl, aryl, hydroxy-alkyl, amino-alkyl, mercapto-alkyl, or phospho-alkyl moiety; R_{12} may also be $—O^{(-1)}$ or —OH;

W_1 is independently selected for each of said units from the group consisting of hydrogen; an acyl moiety; an acetyl; a benzoyl moiety; 3-allyloxy-2-hydroxy-propyl-; 3-benzyloxy-2-hydroxy-propyl-; 3-alkylbenzyloxy-2-hydroxy-propyl-; 3-phenoxy-2-hydroxy-propyl-; 3-alkylphenoxy-2-hydroxy-propyl-; 3-butoxy-2-hydroxy-propyl; 3-alkyloxy-2-hydroxy-propyl; 2-hydroxyoctyl-; 2-hydroxy-alkyl-; 2-hydroxy-2-phenyl ethyl-; 2-hydroxy-2-alkyl phenyl ethyl-; benzyl-; methyl-; ethyl-; propyl-; alkyl; allyl; alkyl benzyl-; haloalkyl-; haloalkenyl; 2-chloro-propenyl-; sodium, potassium; tetra aryl ammonium; tetra alkyl ammonium; tetra alkyl phosphonium; tetra aryl phosphonium; or a condensation product of ethylene oxide, propylene oxide, or a mixture or copolymer thereof;

(b) comprises:

a polymer material having at least one unit having the formula:

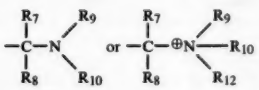


wherein:

R_1 through R_2 are independently selected for each of said units from the group consisting of hydrogen, an alkyl group having from 1 to about 5 carbon atoms, or an aryl group having from about 6 to about 18 carbon atoms;

Y_1 through Y_3 are independently selected for each of said units from the group consisting of hydrogen, —CR_4-R_5OR_6, —CH_2Cl, an alkyl or aryl group having from 1 to 18 carbon atoms, or Z,

Z is



but at least a fraction of the Y_1, Y_2, or Y_3 of the final compound must be Z, and at least a fraction of said Z must

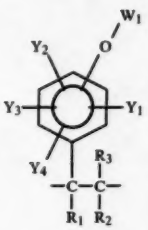
contain a polyhydroxy alkyl-amine functionality resulting from the condensation of an amine or NH_3 and a ketose, aldose or other alkylaminopolyhydroxy compound having from about 3 to about 8 carbon atoms then reduced to the amine;

R_4 through R_{12} are independently selected for each of said units from the group consisting of hydrogen, or an alkyl, aryl, hydroxy-alkyl, amino-alkyl, mercapto-alkyl or phospho-alkyl moiety; R_{12} may also be $—O^{(-1)}$ or —OH;

W_2 is independently selected for each of said units from the group consisting of hydrogen; an acyl moiety; acetyl; benzoyl; 3-allyloxy-2-hydroxy-propyl-; 3-benzyloxy-2-hydroxy-propyl-; 3-alklbenzyloxy-2-hydroxy-propyl-; 3-phenoxy-2-hydroxy-propyl-; 3-alkylphenoxy-2-hydroxy-propyl-; 3-butoxy-2-hydroxy-propyl-; 3-alkyloxy-2-hydroxy-propyl-; 2-hydroxyoctyl-; 2-hydroxy-alkyl-; 2-hydroxy-2-phenyl-ethyl-; 2-hydroxy-2-alkyl-phenylethyl-; benzyl-; methyl-; ethyl-; propyl-; alkyl; allyl-; alkylbenzyl-; haloalkyl-; haloalkenyl; 2-chloro-propenyl-; or a condensation product of ethylene oxide, propylene oxide, or a mixture thereof;

(c) comprises:

a co-polymer material wherein at least one portion of said co-polymer has the structure:



and at least a fraction of said portion is polymerized with one or more monomers independently selected for each of said units from the group consisting of methacrylonitrile, methyl acrylate, methyl methacrylate, vinyl acetate, vinyl methyl ketone, isopropenyl methyl ketone, acrylic acid, methacrylic acid, acrylamide, methacrylamide, n-amyl methacrylate, styrene, m-bromostyrene, p-bromostyrene, pyridine, diallyldimethylammonium salts, 1,3-butadiene, n-butyl acrylate, tert-butylamino-ethyl methacrylate, n-butyl methacrylate, tert-butyl methacrylate, n-butyl vinyl ether, tert-butyl vinyl ether, m-chlorostyrene, o-chlorostyrene, p-chlorostyrene, n-decyl methacrylate, N,N-diallylmelamine, N,N-di-n-butylacrylamide, di-n-butyl itaconate, di-n-butyl maleate, diethylaminoethyl methacrylate, diethyleneglycol monovinyl ether, diethyl fumarate, diethyl itaconate, diethyl vinylphosphonate, vinylphosphonic acid, diisobutyl maleate, diisopropyl itaconate, diisopropyl maleate, dimethyl fumarate, dimethyl itaconate, dimethyl maleate, di-n-nonyl fumarate, di-n-nonyl maleate, dioctyl fumarate, di-n-octyl itaconate, di-n-propyl itaconate, n-dodecyl vinyl ether, ethyl acid fumarate, ethyl acid maleate, ethyl acrylate, ethyl cinnamate, N-ethylmethacrylamide, ethyl methacrylate, ethyl vinyl ether, 5-ethyl-2-vinylpyridine, 5-ethyl-2-vinylpyridine 1-oxide, glycidyl acrylate, glycidyl methacrylate, n-hexyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, isobutyl methacrylate, isobutyl vinyl ether, isoprene, isopropyl methacrylate, isopropyl vinyl ether, itaconic acid, lauryl methacrylate, methacrylamide, methacrylic acid, methacrylonitrile, N-methylolacrylamide, N-methylolmethacrylamide, N-isobutoxymethylacrylamide, N-isobutoxymethylmethacrylamide, N-alkyloxymethylacrylamide, N-alkyloxymethylmethacrylamide, N-vinyl-caprolactam, methyl acrylate, N-methylmethacrylamide, αmethylstyrene, m-methylstyrene, o-methylstyrene, p-methylstyrene, 2-methyl-5-vinylpyridine, n-propyl methacrylate, sodium p-styrenesulfonate, stearyl methacrylate, styrene, p-styrenesulfonic acid, p-styrenesulfonamide, vinyl bromide, 9-vinylcarbazole, vinyl chloride, vinylidene chloride, 1-vinylnaphthalene, 2-vinylnaphthalene, 2-vinylpyridine, 4-vinylpyridine, 2-vinylpyridine N-oxide, 4-vinylpyrimidine, N-vinylpyrrolidone; and W_1, Y_1–Y_4 and R_1–R_3 are as in (a), above;

(d) comprises:

a condensation polymer of polymer materials (a), (b), or (c), wherein a condensable form of (a), (b), (c), or a mixture thereof, is condensed with a second compound selected from the group consisting of phenols, tannins, novolak resins, lignin compounds, together with aldehydes, ketones or mixtures thereof, to produce a condensation resin product, said condensation resin product then being further reacted by the addition of "Z" to at least a portion of it by reacting said resin product with (1) an aldehyde or ketone and (2) a secondary amine producing a final adduct which can react with an acid.

5,068,300

BIFUNCTIONAL STILBENE COMPOUNDS CONTAINING AT LEAST ONE Z-CONFIGURATED STILBENE GROUP, PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE PREPARATION OF POLYMERS

Dieter Arlt, Cologne; Axel Bader, Bergisch Gladbach, and Volker Eckhardt, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

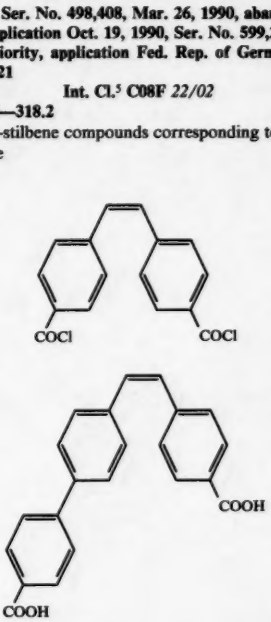
Division of Ser. No. 498,408, Mar. 26, 1990, abandoned. This application Oct. 19, 1990, Ser. No. 599,258

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911221

Int. Cl.[5] C08F *22/02*

U.S. Cl. 526—318.2 **1 Claim**

1. New Z-stilbene compounds corresponding to the following formulae



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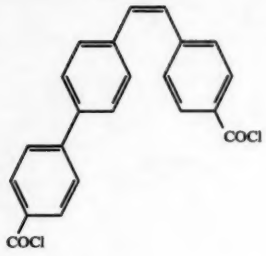

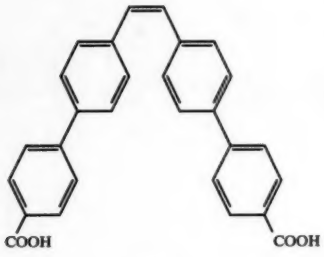

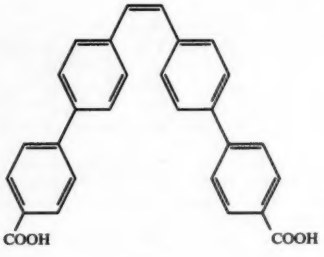

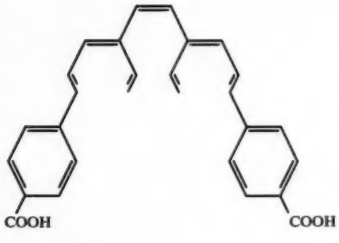

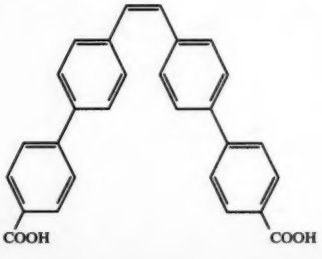

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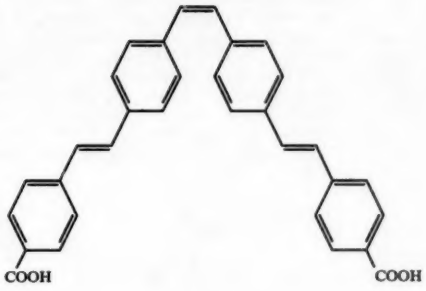
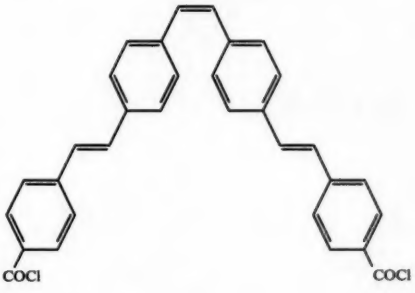
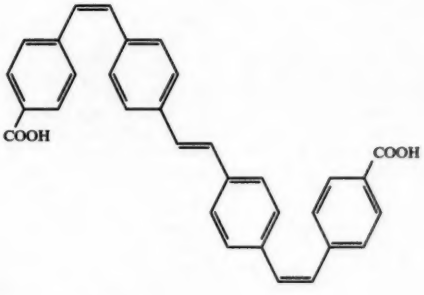
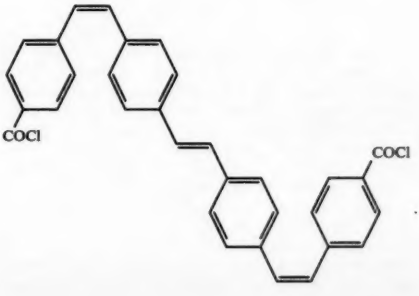








5,068,301

COATING COMPOSITION FOR ELECTROPHOTOGRAPHIC CARRIER

Yoshio Okamura; Mitsuhiro Takarada; Yoshiteru Kobayashi, and Tadashi Takahashi, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,544

Claims priority, application Japan, Sep. 9, 1988, 63-226270

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 9 Claims

1. A coating composition for an electrophotographic carrier, which comprises:

(A) 100 parts by weight of a compound represented by the general formula (1):

$$R_aX_bSiO_{(4-(a+b))/2} \quad (1)$$

wherein R represents a substituted or unsubstituted hydrocarbon residue; X represents a hydroxyl group or a hydrolyzable group; "a" is a number in the range of $0.8<a<1.8$; and "b" is a number in the range of $0.01<b\leqq 3$;

(B) 0.05 to 50 parts by weight of an organohydrogenpolysiloxane having at least two hydrogen atoms bonded directly to a silicon atom; and

(C) a curing catalyst for (A) and (B).

5,068,302

POLYSILOXANE-POLYCARBONATE BLOCK COPOLYMERS BASED ON CERTAIN DIHYDROXYDIPHENYLCYCLOALKANES

Peter Horlacher, Senden; Volker Serini; Dieter Freitag, both of Krefeld; Ulrich Grigo, Kempen; Karsten-Josef Idel, Krefeld, and Uwe Westeppe, Mettmann, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Aug. 8, 1990, Ser. No. 564,473

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1989, 3926850

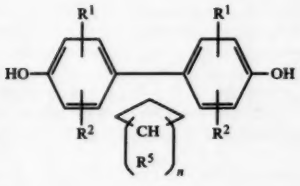
Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—21 4 Claims

1. A thermoplastic molding composition comprising a polydiorganosiloxane-polycarbonate block copolymer having a weight average molecular weight of about 10,000 to 300,000 as measured by ultracentrifugation or scattered light based on

(i) a α,ω-bishydroxyaryloxy polysiloxane having a degree of polymerization of 5 to 300 and

(ii) at least one dihydroxydiphenylcycloalkane corresponding to



(I)

in which

R^1 and R^2 independently of one another represent at least one member selected from the group consisting of hydrogen atom, a halogen atom C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-10} aryl and C_{7-12} aralkyl radicals,

n=2 or 3

and the substituents R^5 independently of one another are hydrogen or C_{1-12} alkyl, characterized in that at least one of the substituents R^5 is not hydrogen, and in that the content of its polydiorganosiloxane is about 1 to 25 percent relative to the weight of said copolymer.

5,068,303

ORGANOSILICON MATERIALS

John K. Bard, and Julia S. Burnier, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 422,214, Oct. 16, 1989, Pat. No. 5,008,360. This application Sep. 28, 1990, Ser. No. 588,627

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—25 19 Claims

1. A crosslinkable organosilicon prepolymer or crosslinked organosilicon polymer comprising alternating hydrocarbon and cyclic polysiloxane residues, which is the hydrosilation reaction product of:

(a) at least one polyene having at least two non-aromatic, non-conjugated carbon-carbon double bonds highly reactive in hydrosilation, the carbon-carbon double bonds being either in an alpha, beta or gamma position on a linear carbon moiety, next to two bridgehead positions in a strained polycyclic aliphatic ring structure, or in a cyclobutene ring, other than polycyclic polyenes having two reactive double bonds in a fused ring system;

(b) at least one polycyclic polyene having at least two chemically distinguishable non-aromatic, non-conjugated carbon-carbon double bonds in its rings wherein the at least two carbon-carbon double bonds have highly different rates of reaction in hydrosilation and one of the carbon-carbon double bonds will react prior to substantial reaction of the other carbon-carbon double bond(s);

(c) at least one cyclic polysiloxane containing three or more ≡SiH groups.

5,068,304

MOISTURE-CURABLE RESIN COMPOSITION

Toshihiko Higuchi, Yokohama; Yasuhiko Nakano, Zushi; Nobuaki Kunii, Yokohama; Yoshiyuki Yamaguchi, Yokohama, and Shigeyuki Kozawa, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 6, 1989, Ser. No. 446,661

Claims priority, application Japan, Dec. 9, 1988, 63-310149; Apr. 11, 1989, 1-89827

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—28 14 Claims

1. A moisture-curable resin composition containing a hydrolyzable silyl group-containing polyether compound as a curable component, said polyether compound comprising polyoxyalkylene chains derived from a polyoxyalkylene polyol having a hydroxyl value, x mgKOH/G, wherein x ranges from to 5 to 35, a total degree of unsaturation, y meq/g, wherein y is not higher than 0.07 meq/g and $h\leqq 0.9/(x-10)$, from 2 to 8 hydroxyl groups, and a content of oxyalkylene groups having at least 3 carbon atoms, of at least 60% by weight, and a hydrolyzable silyl group-containing terminal group present at least 1.3 terminals on the average of said polyoxyalkylene chains, said terminal group having a urethane bond linked to the polyoxyalkylene chain.

5,068,305

POWDER COATING COMPOSITIONS CONTAINING POLYURETHANES HAVING (METH)ACRYLOYL GROUPS AS BINDERS

Jürgen Meixner, Krefeld; Josef Pedain, Cologne; Peter Höhlein, Kempen, and Hans-Joachim Kreuder, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 20, 1990, Ser. No. 556,223

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1989, 3924679

Int. Cl.[5] C08G *18/30*

U.S. Cl. 528—49 3 Claims

1. A powder coating composition which may be cured in the presence of heat and/or high energy radiation and comprises a

polyurethane which melts at a temperature of 50° to 180° C., contains 3 to 10% by weight of olefinic double bonds in the form of (meth)acryloyl groups (calculated as =C=C=, molecular weight =24) and comprises the reaction product of

A) 40–80 parts by weight of one or more organic polyisocyanates with

B) 15–50 parts by weight of one or more monohydric alcohols containing (meth)acryloyl groups and

C) 2–20 parts by weight of one or more compounds which are free from (meth)acryloyl groups and have molecular weights of from 62–200 and contain at least two isocyanate reactive groups.

5,068,306

PROCESS FOR THE PREPARATION OF O-AMINOPHENYL DERIVATIVES OF AMINATED POLY(ALKYLENE GLYCOLS) AND BACKBONE-MODIFIED DERIVATIVES THEREOF

Robert F. Harris, and Michael D. Joseph, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 30, 1990, Ser. No. 605,591
Int. Cl.[5] C08G *18/32*
U.S. Cl. 528—68 **34 Claims**

1. A process for the preparation of an o-aminophenyl derivative of a polyalkyleneoxy polyamine which comprises adding a polyalkyleneoxy polyamine to a dispersion or solution of an isatoic anhydride under reaction conditions sufficient to form the corresponding o-aminophenyl derivative.

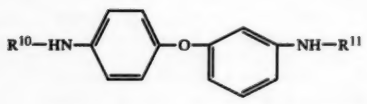
5,068,307

POLYAMIDEIMIDES CONTAINING 3,4'-DIAMINO-DIPHENYLETHER AS DIAMINE COMPONENT AND PROCESS FOR PREPARING THE SAME

Shigeyoshi Hara; Hiroo Inata, and Shunichi Matsumura, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 268,479, Nov. 8, 1988, Pat. No. 4,902,740, which is a continuation-in-part of Ser. No. 888,524, Jul. 23, 1986, abandoned. This application Nov. 8, 1989, Ser. No. 433,194
Claims priority, application Japan, Jul. 26, 1985, 60-163864; Sep. 18, 1985, 60-204321; Jul. 6, 1988, 63-166859
Int. Cl.[5] C08G *73/14*
U.S. Cl. 528—125 **5 Claims**

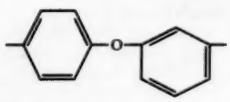
1. A process for preparing a polyamideimide which comprises thermally condensing in a molten state and acid component mainly comprising a member selected from the group consisting of trimellitic acid, trimellitic anhydride and a mixture of these, and a diamine component of the following formula (IX)



(IX)

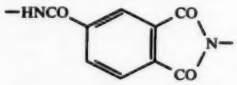
wherein R^{10} and R^{11} are identical or different and each represents a hydrogen atom or a lower acyl group having 1 to 3 carbon atoms in the alkyl moiety, provided that 5 to 60 mole % of the sum of R^{10} and R^{11} consists of hydrogen atoms,

to form a polyamideimide comprising a unit of the following formula (II)



(II)

and a unit of the following formula (IV)



(IV)

as main units forming the molecular chains of the polyamideimide, said polyamideimide having an inherent viscosity, measured at 30° C. in N-methylpyrrolidone, of above 0.48.

5,068,308

CONTINUOUS PREPARATION OF AROMATIC POLYCONDENSATES

Gunter Pipper, Bad Durkheim; Gerhard Heinz, Weisenheim, and Bernd Hisgen, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 365,130
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1988, 3820361
Int. Cl.[5] C08G *69/28, 63/668, 63/688*
U.S. Cl. 528—171 **8 Claims**

1. A process for preparing an aromatic polycondensate formed from

a) an aromatic hydroxy-, thio- or amino-carboxylic acid where the hydroxyl, thio or amino group is not vicinal to the carboxyl group,

b) an aromatic dihydroxy-, dithio-, diamino- or hydroxyamino compound in which the hydroxyl, thio and amino groups are not vicinal to one another and which may have been replaced to an extent of up to 30 mol % by an alkanediamine of from 4 to 10 carbon atoms or a cycloalkanediamine of from 5 to 8 carbon atoms,

c) urea as an optional component and

d) a molar amount equivalent to the sum of components b) and c) of an aromatic dicarboxylic acid in which the carboxyl groups are not in a vicinal arrangement and which may have been replaced to an extent of up to 30 mol % by an alkanedicarboxylic acid of from 6 to 12 carbon atoms or a cycloalkanedicarboxylic acid of from 7 to 10 carbon atoms, comprising the following steps:

1) reacting components a), b), d) and optionally c) with a lower fatty acid anhydride in a molar excess, based on the hydroxyl, thio and amino groups, at from 140° to 280° C. with distillative removal of fatty acid formed and excess fatty acid anhydride to form an oligomer mixture,

2) passing the oligomer mixture from stage 1 downward through an essentially perpendicular tubular precondensation zone having a free surface area of from 0.3 to 1.5 m^2/l with a residence time of from 3 to 30 minutes under a pressure of from 0.5 to 100 mbar at from 250° to 370° C. to form a two-phase mixture of prepolymer and vaporous fatty acid,

3) separating the prepolymer from the vaporous fatty acid and

4) condensing the prepolymer in a condensation zone in the course of a residence time of from 10 to 60 minutes at from 250° to 360° C. under a pressure of from 0.5 to 100 mbar to give a granulable polycondensate.

5,068,309

LOW TEMPERATURE CURABLE DICYANATE ESTER OF DIHYDRIC PHENOL COMPOSITION

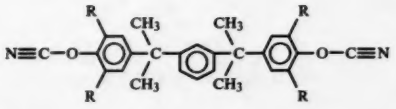
David A. Shimp, Prospect, and Jeffrey T. Vanderlip, Louisville, both of Ky., assignors to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Filed Mar. 29, 1990, Ser. No. 501,231

Int. Cl.[5] C08G *83/00*

U.S. Cl. 528—211 22 Claims

1. A heat curable composition comprising the cyanate ester, 4,4'-[1,3-phenylenebis(1-methylethylidene)]-2,2',6,6'-R-bisphenyl cyanate,



wherein R is independently H or C_1 to C_4 alkyl, in admixture with about 20 to about 500 weight parts per million based on the weight of metal and of the cyanate ester of a coordination metal chelate or carboxylate and about 1 to about 10 weight percent based on the weight of the cyanate ester of a compound containing an active hydrogen and having a boiling point of at least 160° C.

5,068,310

POLYPHENYLENE ETHER PROCESS, CATALYST AND RESIN COMPOSITION

Timothy D. Shaffer, Voorheesville, N.Y., assignor to General Electric Co., Selkirk, N.Y.

Filed Aug. 23, 1990, Ser. No. 571,943

Int. Cl.[5] C08L *67/06, 71/12;* C08G *65/38;* B01J *31/00*

U.S. Cl. 528—215 20 Claims

1. A process for producing a polyphenylene ether resin with low odor properties which comprises the oxidative coupling of a 2,6-di-substituted phenolic compound in the presence of a catalytically effective proportion of a catalyst composition which comprises:

(a) a copper compound;

(b) a diamine wherein the two amino groups are separated by at least two and no more than three carbon atoms and wherein the carbon atom to which the amino nitrogens are attached is aliphatic;

(c) a tertiary amine;

(d) a quaternary ammonium compound; and

(e) an unsaturated compound selected from the group consisting of an olefin, an acetylene, an imine and a nitrile, having non-interfering substituents; and

said process being carried out in the substantial absence of a monoamine other than said tertiary amine.

5,068,311

HIGH MOLECULAR WEIGHT (CO)POLYAMIDE FROM DIAMINO-ALCOHOL

Klaus Horn; Hans-Detlef Heinz, both of Krefeld; Peter-Rolf Müller, Leverkusen, and Ralf Dujardin, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 15, 1990, Ser. No. 538,780

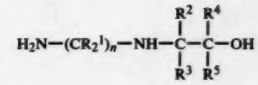
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921164

Int. Cl.[5] C08G *69/26*

U.S. Cl. 528—324 13 Claims

1. Process for the preparation of high molecular weight, m-cresol-soluble (co)polyamides comprising melt condensing 1) at least one lactam or 2) a polyamide-forming diamine/dicarboxylic acid reaction mixture or a mixture of 1) and 2) with

a) 0.005 to 0.99 wt. % of one or more diamino-alcohols of the general formula (I)



(I)

wherein

R^1, R^2, R^3, R^4 and R^5 independently of one another denote hydrogen, or C_1–C_{12}-alkyl, or two radicals, R^1, R^3 or R^5 on the same or adjacent carbon atoms are members of a ring containing 5 to 12 carbon atoms, and

b) amounts of at least one polycarboxylic acid which are approximately equivalent to the amino groups of (I).

5,068,312

POLYARYLENE SULFIDES TERMINATED BY SULFONIC ACID AND/OR SULFONIC ACID DERIVATIVE GROUPS, THEIR PRODUCTION AND USE

Ernst-Ulrich Dorf; Wolfgang Rüsseler; Burkhard Köhler; Wolfgang Ebert, all of Krefeld, and Walter Schmitt, Neuss, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Apr. 2, 1990, Ser. No. 502,630

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911766

Int. Cl.[5] C08G *75/16, 75/14*

U.S. Cl. 528—388 3 Claims

1. Oligo- and polyarylene sulfides corresponding to formula (I)

(I)

in which

Y represents —OR, —OM or —NR_2, where R is as defined for formulae (II), (III) and (IV) below,

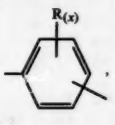
n is an integer of ≧2

m is the number 0, 1 or 2,

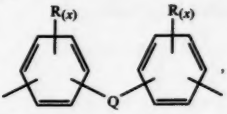
M represents H, an alkali metal, an alkaline earth metal $\cdot\frac{1}{2}$, a metal or group III $\cdot\frac{1}{3}$,

X represents halogen, mercapto, mercaptide or —$S(O)_3$-M—Y— group,

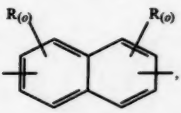
the Ar's are the same or different and represent groups corresponding to formulae (II), (III) and/or (IV)



(II)



(III)



(IV)

in which

the R's are the same or different and represent hydrogen, C_{1-20} alkyl, C_{4-20} cycloalkyl, C_{6-24} aryl, C_{7-24} arylalkyl, two substituents R in the ortho position to one another are attached to form an aromatic or heterocyclic ring containing N, O or S as heteroatoms, and

Q is a single bond or Q represents groups with two bonds,

Ar^1 is an aromatic C_{6-24} radical with two bonds and p is an integer of 1 to 24,
x is the number 1, 2, 3 or 4,
o is the number 1, 2 or 3.

5,068,313

PROCESS FOR MINIMIZING RESIDUAL FREE HYDRAZINE IN POLYMER LATICES

Henry W. Schiessl, Northford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 16, 1989, Ser. No. 352,782
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] C08F *6/10, 6/16, 6/24*
U.S. Cl. 528—483 **11 Claims**

1. A two-step process for reducing or eliminating hydrazine from a mixture of hydrazine and polymer, said polymer being in latex form, which comprises:

(a) contacting said hydrazine in said mixture with an oxygen-containing gas which is air or oxygen at an elevated pressure and a temperature of between about 20° C. and about 100° C. in the presence of a quinone or hydroquinone catalyst in order to effect a reaction of said hydrazine with said oxygen-containing gas in order to produce a purified mixture containing a reduced amount of free hydrazine, and

(b) contacting said free hydrazine in said purified mixture with a hydrazine scavenger in order to bind at least a portion of said free hydrazine, thereby providing a desired mixture containing a reduced amount of free hydrazine therein.

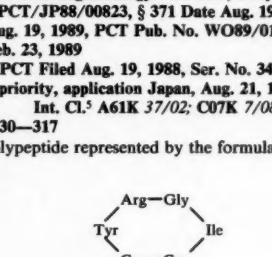
5,068,314

LIPOPOLYSACCHARIDE-BINDING POLYPEPTIDE

Takanori Nakamura, Asaka; Sadaaki Iwanaga; Motonori Ohno, both of Fukuoka, and Kyosuke Miyazaki, Tokyo, all of Japan, assignors to Seikagaku Kogyo Co. Ltd., Tokyo, Japan

PCT No. PCT/JP88/00823, § 371 Date Aug. 19, 1989, § 102(e) Date Aug. 19, 1989, PCT Pub. No. WO89/01492, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 19, 1988, Ser. No. 348,487
Claims priority, application Japan, Aug. 21, 1987, 206258
Int. Cl.[5] A61K *37/02;* **C07K** *7/08*
U.S. Cl. 530—317 **2 Claims**

1. A polypeptide represented by the formula:



(I)

wherein Lys represents lysine, Trp tryptophan, Cys cystine, Phe phenylalanine, Arg arginine, Val valine, Tyr tyrosine, Gly glycine, Ile isoleucine and X a hydroxyl group or an amino group.

5,068,315

COMPOSITION FOR THE REGULATION OF HAIR GROWTH

Travis E. J. Buultjens, Dundee; Colin A. B. Jahoda, and Roy F. Oliver, both of Fife, all of United Kingdom, assignors to University of Dundee, Scotland

Filed Apr. 12, 1990, Ser. No. 508,339
Int. Cl.[5] C07K *15/00;* **A61R** *37/02*
U.S. Cl. 530—324 **1 Claim**

1. Polypeptides isolated from dermal papilla cells with characteristics of apparent isoelectric pH and molecular weight selected from the group consisting of pI 5.1 and 45 kD; pI 5.2 and 43 kD; pI 5.2 and 40 kD; pI 7.3 and 25 kD; and pI 7.4 and 25 kD.

5,068,316

Patent Not Issued For This Number

5,068,317

NOVEL DERIVATIVE OF HUMAN GROWTH HORMONE

Gerald W. Becker, and Ralph M. Riggin, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 15, 1988, Ser. No. 168,208
Int. Cl.[5] A61K *37/36;* **C07K** *13/00, 15/00, 17/00*
U.S. Cl. 530—399 **1 Claim**

1. Met(O)[14]-human growth hormone.

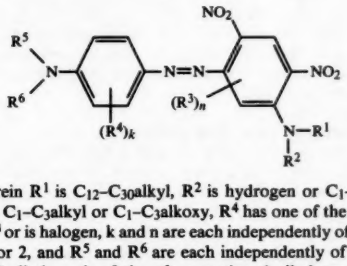
5,068,318

DIAMENODINITROAZO DYES

Gero Decher, Walluf, Fed. Rep. of Germany, and Bernd Tieka, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 215,672, Jul. 6, 1988, Pat. No. 4,941,997. This application May 15, 1990, Ser. No. 523,775
Claims priority, application Switzerland, Jul. 13, 1987, 2656/87
Int. Cl.[5] C09B *29/01, 29/085;* **C07C** *245/08*
U.S. Cl. 534—573 **4 Claims**

1. A compound of formula I



(I)

wherein R^1 is C_{12}–C_{30}alkyl, R^2 is hydrogen or C_1–C_{30}alkyl, R^3 is C_1–C_3alkyl or C_1–C_3alkoxy, R^4 has one of the meanings of R^3 or is halogen, k and n are each independently of the other 0, 1 or 2, and R^5 and R^6 are each independently of the other C_1–C_4alkyl, each of the aforementioned alkyl groups being unsubstituted, partially substituted by fluorine or completely substituted by fluorine, with the proviso that R^1 is alkyl of not less than 18 carbon atoms if R^2 is hydrogen or alkyl of less than 12 carbon atoms.

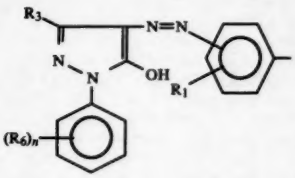
5,068,319

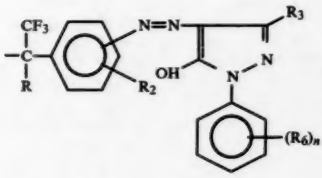
BIZ-DIAZOTIZED DIARYL DIAMINE COUPLED DYES HAVING IMPROVED SOLUBILITY IN ORGANIC SOLVENT

David M. Brown, Charlotte, N.C., and Robert E. Potvin, Kent, R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Mar. 29, 1990, Ser. No. 502,075
Int. Cl.[5] C09B *35/08, 35/205*
U.S. Cl. 534—759 **13 Claims**

1. A dyestuff soluble in organic solvent having the structure:





wherein R is CF_3 or phenyl, R_1 and R_2 are the same or different substituent groups selected from the group consisting of hydrogen, hydroxy, halogen, C_1 to C_3 alkyl and C_1 to C_4 alkoxy, R_3 is selected from the group consisting of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, COOH, and $COOR_5$ wherein R_5 is C_1 to C_4 alkyl, R_6 is selected from the group consisting of hydrogen, sulfo, C_1 to C_3 alkyl, C_1 to C_3 alkoxy and halogen, and n is zero or a whole number ranging from 1 to 3.

5,068,320

2-AMINO-6-(CYCLOPROPYLAMINO)PURINE-9-β-D-2',3'-DIDEOXYRIBOFURANOSIDE AND ITS PHARMACEUTICALLY ACCEPTABLE SALTS

George W. Koszalka, Chapel Hill; Charlene L. Burns, Durham; Thomas A. Krenitsky, Chapel Hill, and Janet L. Rideout, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 179,435, Apr. 8, 1988, abandoned. This application Oct. 6, 1989, Ser. No. 417,989

Claims priority, application United Kingdom, Apr. 9, 1987, 8708512; May 29, 1987, 8712691; Sep. 30, 1987, 8723013

Int. Cl.[5] C07H *19/173*

U.S. Cl. 536—24 **2 Claims**

1. The compound 2-amino-6-cyclopropylaminopurine-9-β-D-2',3'-dideoxyribofuranoside.

5,068,321

CARBONIC ACID ESTERS OF POLYSACCHARIDES AND A PROCESS FOR THEIR PRODUCTION

Hans-Josef Buysch; Alexander Klausener, both of Krefeld; Klaus Szablikowski; Klaus Balser, both of Walsrode, and Michaela Wilke, Schneverdingen, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

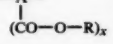
Filed Oct. 13, 1989, Ser. No. 420,841

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836600

Int. Cl.[5] C08B *3/00, 31/04, 37/00*

U.S. Cl. 536—32 **11 Claims**

1. Polysaccharide carbonates containing recurring units corresponding to the following general formula



in which

A is a monosaccharide unit,

R is an aliphatic or cycloaliphatic radical containing 1 to 18 carbon atoms, an araliphatic radical containing 7 to 12 carbon atoms, an aromatic radical containing 6 to 12 carbon atoms optionally substituted by halogen, NO_2, phenyl, $COOR^1$, OR^1 or an aromatic radical containing 6 to 12 carbon atoms substituted by a C_{1-6} aliphatic group,

R^1 is a C_{1-4} alkyl radical and

x is a number of 0.5 to 3.0, at most 20% by weight of the polysaccharide carbonates being soluble in chloroform at 20° C. and at most 30% of the carbonate groups being cyclic carbonate groups.

5,068,322

CRYSTALLINE CEPHALOSPORIN COMPOUNDS

Susumu Nakagawa; Ryosuke Ushijima; Fumio Nakano; Koji Yamada, all of Okazaki, and Eiichi Mano, Kariya, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 315,917, Feb. 27, 1989, Pat. No. 4,959,469, which is a continuation-in-part of Ser. No. 813,614, Dec. 26, 1985, Pat. No. 4,677,100. This application May 14, 1990, Ser. No. 522,817

Claims priority, application Japan, Dec. 27, 1984, 59-273591; Aug. 6, 1985, 60-171839; Dec. 9, 1986, 61-291431

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[5] C07D *501/46;* **A61K** *31/545*

U.S. Cl. 540—222 **1 Claim**

1. (6R,7R)-7-[(Z)-2-(2-aminothiazol-4-yl)-2-(1-carboxy-1-methylethoxyimino)acetamido]-3-(5,6-dihydroxy-2-methyl-2-isoindolinium)methyl-3-cephem-4-carboxylate hydrochloride or its hydrate.

5,068,323

THERMALLY RE-ARRANGED FK-506 DERIVATIVES HAVING IMMUNOSUPPRESSANT ACTIVITY

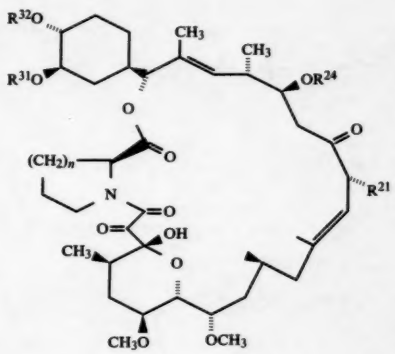
Matthew J. Wyvratt, Jr., Mountainside; Thomas R. Beattie, Scotch Plains; Hyun Ok, Edison; Byron H. Arison, Watchung, and Michael H. Fisher, Ringoes, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 341,981, Apr. 21, 1989, abandoned. This application Apr. 10, 1990, Ser. No. 508,520

Int. Cl.[5] C07D *498/16;* **A61K** *31/395*

U.S. Cl. 540—456 **15 Claims**

1. Compounds having immuno suppressive activity of the formula:



wherein R_{21} is methyl, ethyl, propyl or allyl; R^{24} and R^{32} are, independently, hydrogen or a protecting group for hydroxyl; R^{31} is hydrogen, methyl, or a protecting group for hydroxyl; and n is 1 or 2.

5,068,324

NOVEL AMPHOTERIC POLYMERS

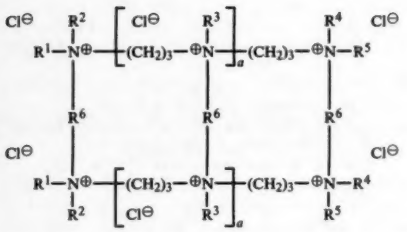
Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to LCE Partnership, Lake Geneva, Wis.

Filed Sep. 5, 1989, Ser. No. 402,649

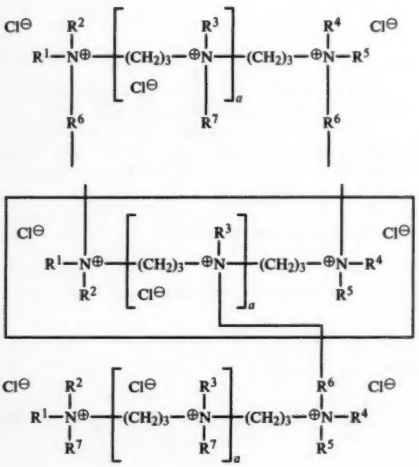
Int. Cl.[5] C07D *521/00*; A61K *7/50*

U.S. Cl. 540—471 **10 Claims**

1. A polymeric amphoteric composition conforming to the following formula:



and



wherein;

R^1 is alkyl having from 6 to 40 carbon atoms;

a is an integer from 0 to 10;

b is an integer from 0 to 100;

R^2, R^3 and R^4 and R^5 are independently selected from

—CH_2CH_2COOM,

—$CH(CH_3)CH_2COOM$

and

—$CH_2C(CH_3)HCOOM$;

M is a cation needed for charge balance and is selected from Na, K, NH4, Li, and Ca.

5,068,325

4,5,7,8-TETRAHYDRO-6H-THIAZOLO[5,4-D]AZEPINES, THEIR PREPARATION AND THEIR USE AS PHARMACEUTICAL COMPOSITIONS

Wolfgang Grell; Rudolf Hurnaus; Manfred Reiffen, all of Biberach; Robert Sauter, Laupheim, all of Fed. Rep. of Germany; Ludwig Pichler; Walter Kobinger, both of Vienna, Austria; Michael Entzeroth, Warthausen, Fed. Rep. of Germany; Joachim Mierau, Mainz, Fed. Rep. of Germany, and Gunter Schingnitz, Bad Kreuznach, Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

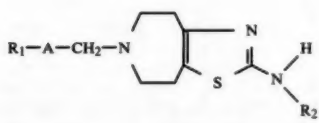
Filed Jun. 20, 1989, Ser. No. 368,753

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1988, 3820775

Int. Cl.[5] G07D *513/04*; A01K *31/55*

U.S. Cl. 514—215 **12 Claims**

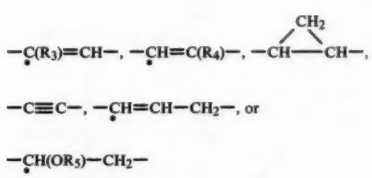
1. 4,5,7,8-tetrahydro-6-thiazoloazepines of general formula II



(II)

wherein

A represents a group of the formulae



wherein

R_3 represents a hydrogen atom or a methyl group,

R_4 represents a C_{1-3} alkyl group or a phenyl group and

R_5 represents a hydrogen atom, a methyl or ethyl group and the carbon atom designated * is linked to the group R_1, and

R_1 represents a phenyl group optionally monosubstituted by a halogen atom or by a C_{1-4}-alkoxy group, a methyl, trifluoromethyl, phenyl, nitro, amino, dimethylamino, piperidino, acetylamino, methylthio, methylsulphinyl, methylsulphonyl, cyano, aminocarbonyl, carboxy, methoxycarbonyl, ethoxycarbonyl, benzyloxy, pyridylmethoxy or hydroxy group; a phenyl group disubstituted by methoxy, benzyloxy, hydroxy or methyl groups, whilst the substituents may be identical or different, or a phenyl group trisubstituted by three methoxy groups, by three hydroxy groups or by one hydroxy or amino group and by two chlorine or bromine atoms,

a pyridyl group optionally substituted by a chlorine atom or by a methyl, methoxy, benzyloxy or hydroxy group, a naphthyl, quinolyl, isoquinolyl, indolyl, furyl, thienyl, (2-indolinon)yl, carbostyril or 3,4-dihydrocarbostyril group,

a thiazolyl group optionally substituted in the 2-position by a methyl or amino group,

a benzothiophenyl or benzofuranyl group,

a benzothiazolyl, benzoxazolyl or benzimidazolyl group optionally substituted in the 2-position by a methyl, phenyl or amino group, or

A represents a carbon-carbon bond and

R_1 represents a 1H-inden-2-yl or 1,2-dihydronaphthalen-3-yl group or a 2H-1-benzopyran-3-yl or 2H-1-benzothiopy-

ran-3-yl group optionally substituted by one or two methyl groups and

R_2 represents a hydrogen atom or an acetyl or propionyl group optionally substituted in the omega-position by a phenyl or 4-methoxyphenyl group, and the acid addition salts thereof.

5,068,326

DOPAMINE RECEPTOR LIGANDS AND IMAGING AGENTS

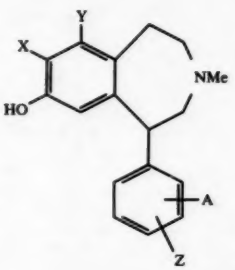
Hank F. Kung, 525 Foxglove La., Wynnewood, Pa. 19096

Filed Apr. 3, 1989, Ser. No. 332,625

Int. Cl.[5] C07D *281/10*

U.S. Cl. 540—594 **26 Claims**

1. A compound of the formula



where

X=OH, Cl or CH_3;

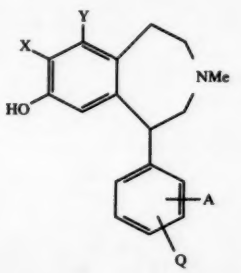
Y=H, Cl, or CH_3, provided that, when X=Cl, then Y=H or CH_3 and when Y=H or CH_3, then X=Cl;

Z=Hal; C=CH—Hal; C_1–C_{10} alkylene-Hal; C_1C_{10} alkylene—C=CH-Hal or C_1–C_{10} alkylene-phenyl-Hal; or C_1–C_{10} alkylene; and

Hal is a radioactive or nonradioactive halogen atom, and

A=H, C_1–C_5 alkyl or C_1–C_5 alkylene-phenyl; or C_1–C_5.

16. A compound of the formula



where

X=OH, Cl or CH_3;

Y=H, Cl, or CH_3, provided that, when X=Cl, then Y=H or CH_3 and when Y=H or CH_3, then X=Cl;

A=H, C_1–C_5 alkyl, C_1–C_5 alkylene-phenyl; or C_1–C_5 alkylene-heteroaryl;

Q =$SnBu_3$, $Si(R)_3$ or HgR; and

R=C_1–C_5 alkyl.

5,068,327

SYMMETRICAL DIOXAZINE COMPOUNDS AND THEIR USE AS FIBER-REACTIVE DYES

Tetsuya Miyamoto, Takatsuki; Miyao Takahashi, Minoo; Takahiko Fujisaki, Takarazuka; Shinei Ikeou, Hirakata, and Takashi Omura, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

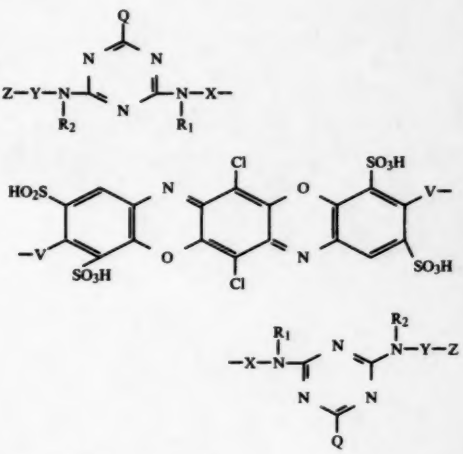
Filed Dec. 11, 1989, Ser. No. 448,644

Claims priority, application Japan, Dec. 10, 1988, 63-312656

Int. Cl.[5] C07D *498/00*

U.S. Cl. 544—76 **12 Claims**

1. A process of dyeing or printing comprising the application of a dioxazine compound represented by the following formula in the free acid form



wherein V is a direct linkage or

in which R_3 is hydrogen or unsubstituted or substituted alkyl, and X is a direct linkage or an aliphatic, araliphatic or aromatic bridging group, provided that X stands for the bridging group as defined hereinabove when V is

Y is unsubstituted or substituted phenylene, or unsubstituted or substituted naphthylene, Z is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Z_1$ in which Z_1 is a group capable of being split by the action of an alkali, Q is sulfo, hydroxy, halo, alkoxy, unsubstituted or substituted phenoxy or unsubstituted or substituted amino, and R_1 and R_2 independently of one another are each hydrogen or unsubstituted or substituted alkyl. in which the material being dyed or printed contains hydroxy or amide groups.

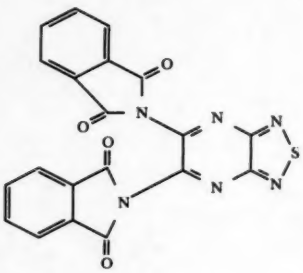
5,068,328

BIS[1,2,5]THIADIAZOLO[3,4-B:3', 4'-E]PYRAZINE, A PROCESS FOR THE PREPARATION THEREOF AND A METHOD OF USING SAME

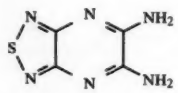
Toshio Mukai, and Yoshiro Yamashita, both of Miyagi, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Toshio Mukai, Miyagi, both of, Japan

Division of Ser. No. 241,278, Sep. 7, 1988, Pat. No. 4,929,730. This application Mar. 13, 1990, Ser. No. 492,592
Claims priority, application Japan, Sep. 8, 1987, 62-223142
Int. Cl.[5] C07D *513/04, 241/20*
U.S. Cl. 544—350 **2 Claims**

1. 5,6-di-phthalimido-(1,2,5)thiadiazolo[3,4-b]pyrazine having the formula:



2. 5,6-diamino-(1,2,5)thiadiazolo[3,4-b]pyrazine having the formula:



5,068,329

AMINOETHYLETHANOLAMINE PRODUCERS COMPOSITION AND METHOD FOR PRODUCING SAME

Lloyd M. Burgess, South Charleston, W. Va., and Charles A. Gibson, Centreville, Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 102,931, Sep. 30, 1987, Pat. No. 4,973,692. This application Sep. 4, 1990, Ser. No. 576,988
Int. Cl.[5] C07D *245/08, 295/12, 211/00*
U.S. Cl. 544—402 **5 Claims**

1. A continuously generated alkyleneamines producers composition comprising, based on 100% of the moles of the composition and exclusive of any MEA and water present,

a) about 50 to about 90 mole % AEEA,
b) less than about 3 mole % EDA but more than 0.01 mole % EDA,
c) less than about 2 mole % DETA but more than 0.01 mole % DETA,
d) about 5 to about 18 mole % of the combination of PIP, AEP and HEP,
e) about 5 to about 20 mole % of one or more of TETAs and TEPAs,
f) less than about 1 mole % of other polyalkylene polyamines,
g) a mole ratio of AEEA to the combination of PIP, AEP, HEP, DETA and EDA is greater than about 2.5,
h) an AEEA to EDA mole ratio greater than about 22 and
i) an AEEA to PIP mole ratio greater than about 7.

5,068,330

AMINOETHYETHANOLAMINE AND ETHYLENEDIAMINE PRODUCERS COMPOSITION AND METHOD FOR PRODUCING SAME

Lloyd M. Burgess, South Charleston, W. Va., and Charles A. Gibson, Centreville, Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 102,928, Sep. 30, 1987, Pat. No. 4,973,692. This application Sep. 4, 1990, Ser. No. 576,987
Int. Cl.[5] C07D *295/08, 295/12;* **C07C** *211/00*
U.S. Cl. 544—402 **3 Claims**

1. A continuously generated alkyleneamines producers composition comprising, based on 100% of the moles of the composition and exclusive of any MEA and water present,

a) about 15 to about 50 mole % AEEA,
b) about 15 to about 55 mole % EDA,
c) about 10 to about 20 mole % DETA,
d) about 5 to about 20 mole % of the combination of PIP, AEP and HEP,
e) about 3 to about 10 mole % of one or more of TETAs and TEPAs,
f) less than about 1 mole % of other polyalkylene polyamines,
g) an DETA to AEEA mole ratio less than 0.77, and
h) an EDA to AEEA mole ratio less than 8.

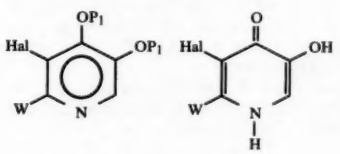
5,068,331

CERTAIN (2-CARBOXY OR 2-PROPENOIC OR 2-CARBONYL)-3-HALO-4,5-DIOXY PYRIDINE INTERMEDIATES AND THE CORRESPONDING 1,4-DIHYDRO-4-PYRIDONES)

Uwe D. Treuner, Etterzhausen, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 232,972, Aug. 17, 1988, Pat. No. 4,959,470. This application Jul. 13, 1990, Ser. No. 552,038
Int. Cl.[5] C07F *7/10;* **C07D** *213/69*
U.S. Cl. 546—14 **1 Claim**

1. Compounds represented by the formula



wherein W is COOH, —HC=CH—COOH or

and P_1 is a protecting group.

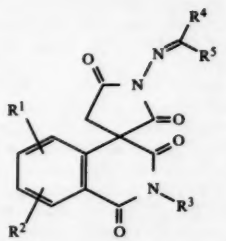
5,068,332

ALKYLIDENE ANALOGS OF 1'-AMINOSPIRO[ISOQUINOLINE-4(1H),3'-PYRROLIDINE]-1,2',3,5'(2H)-TETRONES USEFUL AS ALDOSE REDUCTASE INHIBITORS

Michael S. Malamas, Jamison, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 11, 1990, Ser. No. 596,889
Int. Cl.[5] C07D *471/10*
U.S. Cl. 546—18 **7 Claims**

1. The compound of structural formula (I)



(I)

wherein:

R^1 and R^2 are independently hydrogen, alkyl containing 1 to 6 carbon atoms, halogen, lower alkoxy containing 1 to 6 carbon atoms, trifluoromethyl, nitro,;

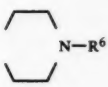
R^3 is lower alkyl containing 1 to 6 carbon atoms or dihalogen substituted benzyl;

R^4 and R^5 are independently hydrogen, alkyl containing 1 to 12 carbon atoms, or R^4 and R^5 are joined to form alicyclic or heterocyclic rings selected from the group consisting of

wherein n=1-10;

wherein X=O,S,SO,SO_2;

wherein X=O,S; and



wherein R^6=H, lower alkyl containing 1 to 6 carbon atoms.

5,068,333

6-CHLORO-3,4-DIHYDRO-PYRANO [2,3-B]PYRIDINES HAVING THE R CONFIGURATION

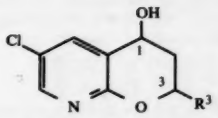
Charles W. Murtiashaw, and George J. Quallich, both of North Stonington, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 7, 1990, Ser. No. 490,906

Int. Cl.[5] C07F *7/02*; C07D *491/048, 213/61*

U.S. Cl. 546—116 **3 Claims**

1. A compound of the formula having the R configuration



wherein R^3 is (C_1–C_4) alkyl.

5,068,334

PHARMACEUTICAL COMPOSITIONS CONTAINING QUINOLIN-2,5-DIONES, NEW QUINOLIN-2,5-DIONES AND PROCESSES FOR THE PREPARATION THEREOF

Erich Muller, Biberach; Josef Nickl, deceased, late of Biberach by Erma Nickl, executor ; Armin Heckel, Biberach, and Gunther Engelhardt, Biberach, all of Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an Der Riss, Fed. Rep. of Germany

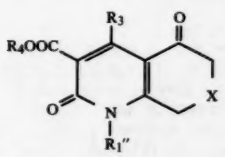
Continuation-in-part of Ser. No. 322,602, Mar. 13, 1989, abandoned. This application Sep. 27, 1989, Ser. No. 413,369

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808136

Int. Cl.[5] C07D *215/227*

U.S. Cl. 546—157 **1 Claim**

1. New quinolinediones of formula



(X)

R^3 is hydrogen, trifluoromethyl, phenyl or C_1–C_3 alkyl,

X is methylene optionally substituted by one or two C_1–C_3 alkyl and

R_1''' is hydrogen, C_1–C_3 alkyl optionally substituted by phenyl, fluorophenyl, chlorophenyl or bromophenyl, by carboxy or by C_2–C_4 alkoxycarboxyl, C_4–C_6 alkyl, C_3–C_6 cycloalkyl, C_3–C_5 alkenyl or C_3–C_5 alkynyl, a C_2–C_3 alkyl substituted in the 2- or 3- position by hydroxy, alkoxy or alkylmercapto, in which the alkoxy or alkylmercapto substituent may in each case contain 1 to 3 carbon atoms, or tetrahydrofurfuryl and R_4 is C_1–C_5 alkyl or R_1''' is C_1–C_3 alkyl optionally substituted by phenyl, fluorophenyl, chlorophenyl or bromophenyl, by carboxy or by C_2–C_4 alkoxycarboxyl, C_4–C_6 alkyl, C_3–C_6 cycloalkyl, C_3–C_5 alkenyl or C_3–C_5 alkynyl, a C_2–C_3 alkyl substituted in the 2- or 3-position by hydroxy, alkoxy or alkylmercapto, in which the alkoxy or alkylmercapto substituent may in each case contain 1 to 3 carbon atoms, or tetrahydrofurfuryl and R_4 is hydrogen.

5,068,335

PROCESS FOR THE PREPARATION OF 4-HYDROXY-2,2,6,6-TETRAMETHYLPIPERIDINE

Ulrich Kress, Bensheim/Bergstrasse; Rudolf Maul, Lorsch/-Hessen, and Siegfried Kintopf, Bensheim/Bergstrasse, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 434,539, Nov. 8, 1989, abandoned, which is a continuation of Ser. No. 186,837, Apr. 27, 1988, abandoned. This application Jun. 18, 1990, Ser. No. 539,298

Claims priority, application Switzerland, May 5, 1987, 1707/87

Int. Cl.[5] C07D *211/46*

U.S. Cl. 546—242 **9 Claims**

1. A process for the preparation of 4-hydroxy-2,2,6,6-tetramethylpiperidine by catalytic hydrogenation of 4-oxo-

2,2,6,6-tetramethylpiperidine in the presence of a metal catalyst from the group consisting of Ni, Co, Ru, Rh, Os and Ir catalysts or mixtures thereof, which comprises carrying out the hydrogenation in the melt without using a solvent.

5,068,336

PROCESS FOR PRODUCING 2-(4'-HYDROXPHENOXY)-3-CHLORO-5-TRIFLUOROMETHYLPYRIDINE

Takumi Kagawa; Takashi Morooka, and Kenji Tsuzuki, all of Shinnanyo, Japan, assignors to Tosoh Corporation, Uchi, Japan

Filed Feb. 26, 1990, Ser. No. 484,513
Int. Cl.[5] C07D *213/643, 213/64, 213/26*
U.S. Cl. 546—302 **7 Claims**

1. A process for producing 2-(4'-hydroxyphenoxy)-3chloro-5-trifluoromethylpyridine comprising the steps of:

mixing hydroquinone, a dehydrohalogenating agent in the amount of 0.10–0.70 equivalent to the hydroquinone, and a mixed solvent of a polar aprotic solvent and an aromatic hydrocarbon solvent;

heating to reflux the resulting mixture at atmospheric pressure to dehydrate the mixture;

adding to the resulting mixture 2,3-dichloro-5-trifluoromethylpyridine in the amount of 0.20–0.95 equivalent to the dehydrohalogenating agent; and

reacting the resulting mixture at 100°–170° C.

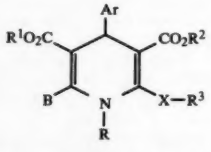
5,068,337

1,4-DIHYDROPYRIDINES AND THEIR ABILITY TO INHIBIT BLOOD PLATELET AGGREGATION, INHIBIT THROMBOXANE SYNTHETASE AND PHOSPHOLIPASE

John L. Archibald, Farnham Royal; Terence J. Ward, and Albert Opalko, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, Great Britain

Continuation of Ser. No. 760,707, Jul. 30, 1985, abandoned. This application Nov. 13, 1986, Ser. No. 930,972
Claims priority, application United Kingdom, Aug. 17, 1984, 8421039; Jun. 21, 1985, 8515751
Int. Cl.[5] A61K *31/505*; C07D *401/04, 471/04*
U.S. Cl. 514—256 **25 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

Ar is an aryl or heteroaryl radical of 5 to 10 ring atoms, the heteroaryl radical having 1 or 2 heteroatoms selected from N, O and S, which is optionally substituted by one or more substituents selected from halogen, alkyl, alkoxy, haloalkyl, haloalkoxy, NO_2, NH_2, CN, alkylamino, dialkyl-amino, aminoalkyl, carboxyl, alkoxycarbonyl, loweralkanoyl, loweralkanoylamino, and aryl of 5 to 10 ring atoms;

R represents hydrogen or an alkyl group or an arylkyl group wherein aryl of aralkyl is an aryl or an heteroaryl radical of 5 to 10 ring atoms, the heteroaryl radical having 1 or 2 heteroatoms selected from N, O and S, which is optionally substituted as above for aryl or heteroaryl of Ar;

R^1 and R^2 are the same or different and are selected from hydrogen and saturated C_5–C_7 cyclic aliphatic hydrocarbon residues, unsaturated acyclic aliphatic hydrocarbon residues of up to 6 carbon atoms and saturated C_1–C_6 acyclic hydrocarbon residues, said residues being optionally substituted by one or more groups selected from halogen, OH, carboxy, CN, alkoxy, alkylthio, aryloxy, alkoxycarbonyl, amino, mono- or diloweralkylamino, and an aryl or heteroaryl radical of 5 to 10 ring atoms the heteroaryl radical having 1 or 2 heteroatoms selected from N, O and S;

X is Z^1, $-Z^1(CH_2)_n-$, $-(CH_2)_n-$, $-(CH_2)_nZ^1-$, $-(CH_{2n}-$, $-CHR^6CH_2-$, $-CH_2CHR^7-$, or $-CHR^6CHR^7-$, wherein n is 1 or 2, Z^1 is NR^8, O or S, R^6 and R^7 each represent a lower alkyl group, and R^8 represents hydrogen or a lower alkyl group;

R^3 is mono- or bicyclic nitrogen ring heteroaryl radical containing 5 to 10 ring atoms of which 1 or 2 are optionally further heteroatoms selected from O, N and S, said radical optionally substituted by 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkyl, haloalkoxy, NO_2, NH_2, CN, alkylamino, dialkylamino, aminoalkyl, carboxy, alkyloxycarbonyl, loweralkanoyl, loweralkanoylamino, phenyl, and heteroaryl of 5 to 10 ring atoms and 1 or 2 heteroatoms selected from N, O, and S; and

B represents hydrogen, carboxyl, lower alkoxycarbonyl, lower alkyl, aminoloweralkyl, lower alkoxyloweralkyl, lower alkoxycarbonyllloweralkyl, carboxyloweralkyl, amino, mono-loweralkylamino or di-loweralkylamino, wherein alkyl, alone or in combination, refers to C_1–C_6 alkyl.

5,068,338

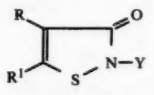
PROCESS FOR NITROSAMINE-FREE SABILIZED ISOTHIAZOLONES

Horst O. Bayer; Barry C. Lange, both of Levittown, and Ramesh B. Petigara, Hatfield, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 376,199, Jul. 3, 1989, Pat. No. 4,939,266, which is a continuation of Ser. No. 383,858, Jun. 1, 1982, abandoned. This application Mar. 27, 1990, Ser. No. 500,158
Int. Cl.[5] C07D *275/03*
U.S. Cl. 548—101 **3 Claims**

1. A process for preparing a biologically active, metal nitrate salt-stabilized, 3-isothiazolone compositions substantially free of nitrosamine impurities and precursors thereof which comprises:

preparing a biologically active 3-isothiazolone substantially free of a by-product compound containing an amine moiety capable of being nitrosated to a nitrosamine, or a nitrosamine compound derived therefrom, which 3-isothiazolone may be represented by the formula:



(I)

wherein R is hydrogen and R^1 is selected from hydrogen and chlorine; and Y is methyl, where said 3-isothiazolone is prepared by a process in which formation of said undesirable by product compound is avoided comprising the steps of

(A) reacting methyl-3-mercaptopropionate with CH_3NH_2 to form N-methyl-3-mercaptopropionamide;

(B) cyclizing said N-methyl-3-mercaptopropionamide with a chlorinating agent to form said 3-isothiazolone; and

(C) adding to said 3-isothiazolone a ring-stabilizing metal nitrate salt in an amount sufficient to stabilize the ring of the 3-isothiazolone.

5,068,339

ENHANCED CHEMILUMINESCENCE FROM 1,2-DIOXETANES THROUGH ENERGY TRANSFER TO TETHERED FLUORESCERS

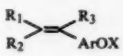
Arthur P. Schaap, and Hashem Akhavan-Jaffi, both of Detroit, Mich., assignors to Board of Governors of Wayne State University, Detroit, Mich.

Division of Ser. No. 289,837, Dec. 27, 1988, which is a continuation-in-part of Ser. No. 887,139, Jul. 17, 1986. This application Nov. 13, 1989, Ser. No. 434,444

Int. Cl.[5] C07F *7/18, 9/6541, 9/655;* **C07D** *277/82*

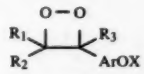
U.S. Cl. 548—110 **18 Claims**

1. An alkene of the formula:



(I)

which can be oxidized to a dioxetane compound of the formula:



(II)

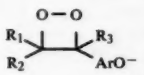
wherein R_1 and R_2 are joined together and are carbon atom containing groups containing between 6 to 30 carbon atoms together and optionally containing an atom selected from the group consisting of oxygen, nitrogen and sulfur atoms in place of carbon which allow the production of the light,

wherein R_3 is a tethered fluorescent molecule containing group wherein the fluorescent molecules exhibit fluorescence between approximately 400 and 900 nanometers,

wherein R_1 and R_2 can be joined together,

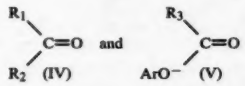
wherein X is a leaving group,

wherein compound (II) decomposes to form an aryl oxide (III) of the formula



(III)

when reacted with an activating agent which removes X, wherein the aryl oxide (III) spontaneously decomposes to form compounds (IV) and (V) of the formulae:



and wherein the fluorescent molecule in the fluorescent molecule containing group is activated to produce light upon the decomposition of the aryl oxide.

5,068,340

ISOTHIAZOLYL SUBSTITUTED GLYCEROL DERIVATIVES CONTAINING PHOSPHATE GROUPS

Norio Nakamura; Hiroyuki Koike, and Takeshi Oshima, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

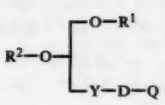
Continuation of Ser. No. 14,936, Feb. 13, 1987, abandoned. This application Jun. 16, 1989, Ser. No. 368,132

Claims priority, application Japan, Feb. 13, 1986, 61-29624

Int. Cl.[5] C07F *9/09, 9/6561*

U.S. Cl. 548—119 **13 Claims**

1. A compound of formula (I):



(I)

in which:

R^1 represents an alkylcarbamoyl group in which the alkyl part is C_8–C_{22};

R^2 represents unsubstituted 3-isoxazolyl or 3-isoxazolyl substituted by C_1–C_6-alkyl, C_1–C_6-aliphatic acyl, aromatic acyl, aryl or C_7–C_{14}-aralkyl;

Y represents a group of formula —X—P(O)(OH)—O—, where:

X represents an oxygen atom;

D represents a C_1–C_{14} alkylene group;

Q represents unsubstituted thiazolyl, unsubstituted pyridyl or thiazolyl or pyridyl substituted with C_1–C_6 alkyl groups, C_1–C_6 alkoxy groups, carbamoyl groups, halogen atoms or C_1–C_6 hydroxyalkyl groups;

and pharmaceutically acceptable salts, esters and amides thereof.

5,068,341

OPTICALLY ACTIVE HYDANTOINS

Eike Poetsch, Mühltal, and Michael Casutt, Pfungstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

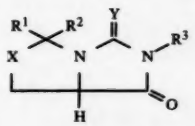
Continuation of Ser. No. 39,341, Apr. 17, 1987, abandoned. This application Sep. 5, 1989, Ser. No. 402,289

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613246; Feb. 7, 1987, 3703871

Int. Cl.[5] C07D *498/04, 513/04*

U.S. Cl. 548—154 **8 Claims**

1. An optically active hydantoin of the formula



wherein

X and Y are each independently O or S;

R^1 and R^2 are each independently are H; C_{1-8}-alkyl, C_{1-8}-alkyl wherein one or two non-adjacent CH_2 groups can also be substituted by O or S; C_{3-8} cycloalkyl; C_{6-14} aryl; C_{7-12}-arylalkyl; C_{6-14} aryl or C_{1-12}-arylalkyl each substituted by C_{1-4} alkyl, C_{1-4} alkoxy, halogen, or C_{1-4}-alkoxycarbonyl; C_{2-6} alk-1-enyl; C_{2-6} alk-2-enyl; or R^1 and R^2 together are C_{2-8} alkylene, or C_{2-8}-alkylene wherein one or two non-adjacent CH_2 groups is replaced by O or S, is benzyl; benzyl substituted by one or more of C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-4}-alkoxycarbonyl, nitro or cyano; C_{2-6} alk-1-enyl; C_{2-6} alk-2-enyl; C_{2-6} alkoxyalkyl; C_{3-16} tri(alkyl and/or aryl)silyl.

5,068,342

5-[(1- AND 2-NAPHTHALENYL)THIO AND SULFONYL]-2,4-THIAZOLIDINEDIONES AND DERIVATIVES THEREOF

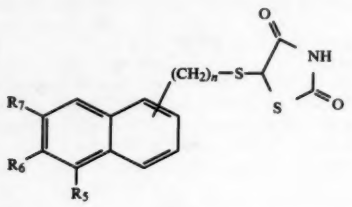
Arie Zask, Manhatten, N.Y., and Ivo Jirkovsky, Plainsboro, N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 428,817, Oct. 27, 1989, Pat. No. 4,997,948. This application Oct. 12, 1990, Ser. No. 596,818

Int. Cl.[5] C07D *277/36*

U.S. Cl. 548—183 **8 Claims**

1. A 1- or 2-thio- or thiomethylenenaphthalene derivative of the formula II



II

or a pharmaceutically acceptable catonic salt thereof, wherein

n is 0 or 1

R_5 is hydrogen, bromo, chloro, trifluoromethyl or difluoroethyl;

R_6 is hydrogen, hydroxy, methoxy or ethoxy; and

R_7 is hydrogen or R_7 and R_6 are both methyl or ethyl carbonate.

5,068,343

4-SUBSTITUTED 5-CHLORO-2-HYDRAZINOTHIAZOLES

Gunter Beck, Leverkusen; Ernst Kysela, Bergisch Gladbach, and Rudolf Braden, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

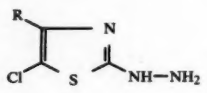
Filed Oct. 31, 1990, Ser. No. 606,375

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 3940794

Int. Cl.[5] C07D *277/50*

U.S. Cl. 548—194 **5 Claims**

1. A 4-substituted 5-chloro-2-hydrazinothiazole of the formula



(I)

in which

R represents CHF_2, CF_3, CN or $COOR^1$, where R^1 represents C_1–C_4-alkyl.

5,068,344

PROCESS FOR THE PREPARATION OF SALT FREE, WATER FREE 3-ISOTHIAZOLONE COMPOUNDS

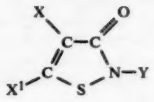
Ramesh B. Petigara, Hatfield; Norman A. Leister, Huntingdon Valley; Barry J. Pendell, Lansdale, and Robert A. Woodruff, Buckingham, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 12, 1990, Ser. No. 464,472

Int. Cl.[5] C07D *275/02*

U.S. Cl. 548—213 **13 Claims**

1. A process for preparing a substantially water free 3-isothiazolone of the formula



wherein

Y is selected from the group consisting of alkyl or hydroxy- or halogen-substituted alkyl of 1 to 10 carbon atoms; unsubstituted or halogen-substituted alkenyl or alkynyl of 2 to 10 carbon atoms; benzyl; 4-methoxybenzyl; 4-chlorobenzyl; phenethyl; 2-(4-chlorophenyl)ethyl; and 4-phenylbutyl;

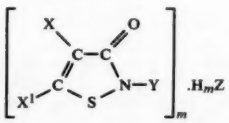
X is hydrogen or a (C_1–C_2) alkyl; and

X^1 is hydrogen, chlorine, or a (C_1–C_2) alkyl; comprising

(a) reacting in the presence of an organic solvent selected from the group consisting of alcohol, glycol, glycol ether, acetate ester, aliphatic hydrocarbon, chlorinated aliphatic hydrocarbon, aromatic hydrocarbon, and chlorinated aromatic hydrocarbon solvents

(i) anhydrous ammonia with

(ii) an isothiazolone salt of the formula



wherein

Z is chlorine, bromine, sulfate or fluorosulfonate;

m is 1 when Z is chlorine, bromine or fluorosulfonate, and m is 2 when Z is sulfate;

using the stochiometric amount or less than the stochiometric amount of anhydrous ammonia necessary to neutralize said salt; and

(b) separating the resultant $(NH_4)_mZ$ from the resultant free base isothiazolone;

(c) said resultant free base isothiazolone containing less than about 0.5% $(NH_4)_mZ$ based on weight of isothiazolone.

5,068,345

OXAZOLIDINONE ALDOL ADDUCT

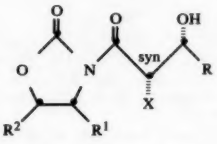
Carl R. Illig, and Alexander L. Weis, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1989, Ser. No. 428,800

Int. Cl.[5] C07D *263/04*

U.S. Cl. 548—230 **7 Claims**

1. A compound having the following formula:



wherein R is alkyl having 6–12 carbon atoms, alkenyl having from 2 to 22 carbon atoms or aryl having 6–25 carbon atoms, R^1 is benzyl, R^2 is hydrogen or alkyl having from 1–10 carbon atoms, and X is a halogen atom.

5,068,346

TETRAZOLE COMPOUNDS

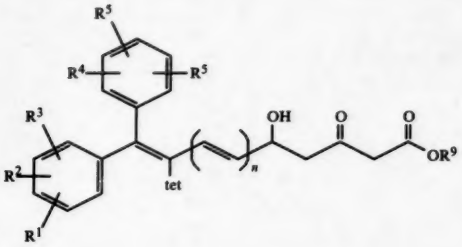
Sing-Yuen Sit, Meriden, and John J. Wright, Middletown, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 151,513, Feb. 18, 1988, Pat. No. 4,897,490, which is a continuation-in-part of Ser. No. 18,542, Feb. 25, 1987, abandoned. This application Nov. 17, 1989, Ser. No. 437,942

Int. Cl.[5] C07D *257/04*

U.S. Cl. 548—253 **16 Claims**

1. A compound of the formula



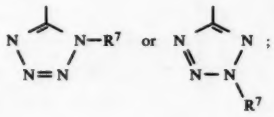
wherein

R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, or trifluoromethyl;

R^2,R^3,R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy;

n is an integer of from 0 to 2, inclusive;

tet is



R^7 is C_{1-4} alkyl, C_{1-4} alkoxy(lower)alkyl, (2-methoxyethoxy)methyl or triphenylmethyl; and

R^9 is a hydrolyzable ester group.

5,068,347

PROCESS FOR THE PREPARATION OF 3-MERCAPTO-5-AMINO-(1H)-1,2,4-TRIAZOLE

Wallace E. Puckett, Memphis, Tenn., and R. Garth Pews, Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Nov. 23, 1987, Ser. No. 124,132

Int. Cl.[5] C07D *249/14*

U.S. Cl. 548—263.8 **3 Claims**

1. A process for the preparation of 3-mercapto-5-amino-(1H)-1,2,4-triazole which comprises contacting 2,5-diamino-1,3,4-thiadiazole or a salt thereof with a base in a suitable solvent.

5,068,348

TRIAZOLE METHINE COMPOUNDS

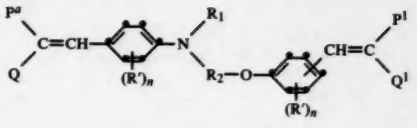
Max A. Weaver; Wayne P. Pruett, Kingsport, and Samuel D. Hilbert, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 182,633, Apr. 18, 1988, Pat. No. 4,958,043. This application Dec. 20, 1989, Ser. No. 454,087

Int. Cl.[5] C07D *249/12*

U.S. Cl. 548—264.4 **6 Claims**

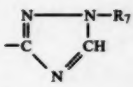
1. A compound having the structural formula:



wherein:

n is 0, 1, or 2;

R_1 is straight or branched alkyl substituted with —O—R_6, —S—R_6 or —$SO_2CH_2CH_2SR_6$, wherein R_6 is a group of the formula:



wherein each R_7 is independently selected from:

H,

alkyl,

phenoxyalkyl,

alkylsulfonylalkyl,

alkylthioalkyl,

alkanoyloxyalkyl,

aryl,

—OXR_8, —$NHXR_8$ or —XR_8, wherein X is —CO—, —COO—, or —SO_2—; and each R_8 is selected from:

alkyl,

cycloalkyl,

phenoxyalkyl,

alkylsulfonylalkyl,

alkythioalkyl,

alkanoyloxyalkyl; and, when X is —CO—, R_8 can further be selected from:

H,

alkenyl,

amino,

alkylamino,

dialkylamino,

arylamino,

aryl,

alkoxy,

alkanoyloxyalkoxy,

phenoxy,

alkylphenoxy,

carboxyphenoxy,

alkoxyphenoxy,

carbalkoxyphenoxy, or

halogenophenoxy;

R_2 is selected from:

alkylene,

alkylene substituted with —Z—B'—CH=C(P^a)Q, wherein Z and B' are as defined above and P^a and Q are as defined below,

arylene,

aralkylene,

alkylene-O-alkylene,

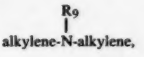
alkylene-O-arylene-O-alkylene,

alkylene-arylene-alkylene,

alkylene-cyclohexylene-alkylene,

alkylene-S-alkylene,

alkylene-SO_2-alkylene,



wherein R_9 is selected from:

alkyl,

aryl,

alkanoyl,

alkylsulfonyl,
aroyl, or
arylsulfonyl;

P^a, Q, P^1 and Q^1 are each independently selected from:
cyano,
carbalkoxy,
carbocycloalkoxy,
carbaryloxy,
carbaralkyloxy,
carbalkenyloxy,
carbamyl,
carboxy,
alkanoyl,
aroyl,
N-alkylcarbamyl,
N-alkyl-N-arylcarbamyl,
N,N-dialkylcarbamyl,
N-arylcarbamyl,
N-cyclohexylcarbamyl,
—SO_2-alkyl,
—SO_2-aryl,
aryl;

with the proviso that at least one of R_1, R_2, P^a, Q, P^1 and Q^1 is a group reactive under condensation polymerization conditions, or bears a group reactive under condensation polymerization conditions, so as to incorporate said compound into the resulting polymer, said group selected from:
carboxy,
carbalkoxy,
carbaryloxy,
N-alkylcarbamyloxy,
alkanoyloxy,
chlorocarbonyl,
carbamyloxy,
amino,
alkylamino,
hydroxyl,
N-phenylcarbamyloxy,
cyclohexanoyloxy, or
carbocyclohexyloxy;

wherein in each of the above definitions the alkyl or alkylene moieties or portions of the various groups contain up to 8 carbon atoms, straight or branched chain, aryl or heteroaryl moieties or portions of the various groups contain in the range of 2 up to 10 carbon atoms; wherein said compound contains at least one heterocyclic moiety; and wherein each alkyl, alkylene, alkoxy, aryl, or cycloalkyl moiety or portion of a group or radical can be further substituted with hydroxy, acyloxy, alkyl, cyano, alkoxycarbonyl, halogen, carbonylhalide, alkoxy, aryl, aryloxy, cycloalkyl, amino, alkylamino, alkanoylamino, or carboxy groups.

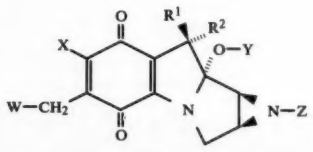
5,068,349

MITOMYCIN DERIVATIVES

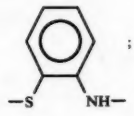
Yutaka Kanda, Houston, Tex.; Masaji Kasai, Fujisawa, Japan; Hitoshi Arai; Makoto Morimoto, both of Shizuoka, Japan, and Tadashi Ashizawa, Numazu, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 404,353
Claims priority, application Japan, Sep. 9, 1988, 63-224484
Int. Cl.[5] C07D *487/14;* A61K *31/40*
U.S. Cl. 548—418 **3 Claims**

1. A mitomycin derivative represented by the formula:



wherein W represents RO or RS (wherein R represents hydrogen; alkyl having 1 to 12 carbon atoms which may be substituted with 1 or 2 substituents independently selected from the group consisting of hydroxy, lower alkoxy having 1 to 4 carbon atoms, lower alkoxycarbonyl having 2 to 5 carbon atoms and alicyclic alkyl having 3 to 6 carbon atoms; alkenyl having 2 to 12 carbon atoms; a substituted or non-substituted aralkyl selected from the group consisting of benzyl, phenethyl and benzhydryl; or a substituted or non-substituted aryl selected from the group consisting of phenyl and naphthyl; substituents for said substituted aralkyl and for said substituted aryl being 1 to 3 substituents independently selected from the group consisting of hydroxy, lower alkoxy having 1 to 4 carbon atoms, halogen, nitro and lower alkyl having 1 to 4 carbon atoms; X represents methoxy or amino; or W and X are combined together to form —S(CH_2)$_2$NH— or



;

Y represents hydrogen or methyl; Z represents hydrogen, methyl or lower alkanoyl having 1 to 4 carbon atoms; and one of R^1 and R^2 represents carbamoyloxymethyl and the other represents hydrogen.

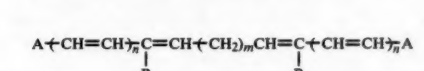
5,068,350

POLYOLEFIN DERIVATIVES

Mitsuru Hashimoto; Tomoyuki Shimada, both of Numazu; Nobuo Suzuki, Kouriyama; Takayuki Sakai, Tokyo; Susumu Suzuka, Yono, and Masaomi Sasaki, Susono, all of Japan, assignors to Ricoh Company, Ltd. and Hodogaya Chemical Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 245,288, Sep. 16, 1988, Pat. No. 4,965,157. This application Aug. 3, 1990, Ser. No. 562,623
Claims priority, application Japan, Sep. 17, 1987, 62-232894; Sep. 17, 1987, 62-232895; May 27, 1988, 63-131247; May 27, 1988, 63-131248
Int. Cl.[5] C07D *209/86*
U.S. Cl. 548—444 **6 Claims**

1. Polyolefin derivatives having the following formula (I):



(I)

wherein A represents a substituted or unsubstituted N-substituted carbazolyl group, R represents hydrogen, an alkyl group, an aralkyl group or a substituted or unsubstituted aryl group; m is an integer of 2 to 8; an n is an integer of 0 or 1.

5,068,351

PROCESS FOR THE PREPARATION OF N OCTAHYDROPENTA (6) PYRROLE CARBOXYLATES

Volker Teetz, Hofheim am Taunus; Hans Wissmann, Bad Soden am Taunus, and Hansjörg Urbach, Kronberg/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

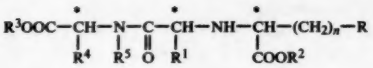
Continuation of Ser. No. 403,919, Sep. 7, 1989, abandoned, which is a continuation of Ser. No. 178,767, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 943,882, Dec. 19, 1986, abandoned, which is a continuation of Ser. No. 650,715, Sep. 14, 1984, abandoned. This application Jul. 27, 1990, Ser. No. 560,004

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333454

Int. Cl.[5] **C07D** *207/00, 209/52*

U.S. Cl. 548—452 **18 Claims**

1. A process for the preparation of a compound of the formula I



(I)

in which

n is 1 or 2;

R denotes hydrogen,

an optionally substituted aliphatic radical having 1 to 8 carbon atoms,

an optionally substituted alicyclic radical having 3–9 carbon atoms,

an optionally substituted aromatic radical having 6–12 carbon atoms,

an optionally substituted araliphatic radical having 7–14 carbon atoms,

an optionally substituted alicyclic-aliphatic radical having 7–14 carbon atoms, or

a radical OR^a or SR^a, in which R^a represents an optionally substituted aliphatic radical having 1–4 carbon atoms, an optionally substituted aromatic radical having 6–12 carbon atoms or an optionally substituted heteroaromatic radical having 5–12 ring atoms;

R^1 denotes hydrogen,

an optionally substituted aliphatic radical having 1–6 carbon atoms,

an optionally substituted alicyclic radical having 3–9 carbon atoms,

an optionally substituted alicyclic-aliphatic radical having 4–13 carbon atoms,

an optionally substituted aromatic radical having 6–12 carbon atoms,

an optionally substituted araliphatic radical having 7–16 carbon atoms,

an optionally substituted heteroaromatic radical having 5–12 ring atoms, or

if not already included above, the side chain, protected when appropriate, of a naturally occurring alpha-amino acid;

R^2 and R^3 are identical or different and denote hydrogen,

an optionally substituted aliphatic radical having 1–6 carbon atoms,

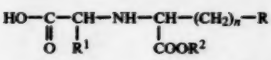
an optionally substituted alicyclic radical having 3–9 carbon atoms,

an optionally substituted aromatic radical having 6–12 carbon atoms, or

an optionally substituted araliphatic radical having 7–16 carbon atoms; and

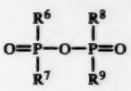
R^4 and R^5, together with the atoms bearing them, form an optionally substituted octahydrocyclopenta[b]pyrrole ring system;

which process comprises reacting a compound of the formula II



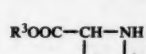
(II)

in which n, R, R^1 and R^2 have the meanings defined above, and where the amine group —NH— shown in the structure of the compound of formula II is unprotected, in the presence of at least one phosphinic anhydride of the formula III



(III)

in which R^6, R^7, R^8 and R^9 are identical or different and represent alkyl and/or aralkyl, with a compound of the formula IV



(IV)

in which R^3, R^4 and R^5 have the meanings defined above.

5,068,352

BISIMIDODIPHENOL DERIVATIVES

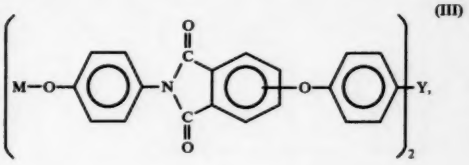
David N. Schissel, Scotia, and Deborah A. Haitko, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 7,467,453, Jan. 9, 1990, Pat. No. 4,988,792. This application Oct. 31, 1990, Ser. No. 606,417

Int. Cl.[5] **C07D** *403/10*

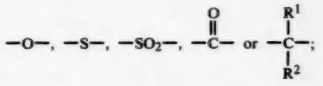
U.S. Cl. 548—461 **3 Claims**

1. A bisimidodiphenol derivative having the formula



(III)

wherein M is acyl; Y is



and each of R^1 and R^2 is independently hydrogen, methyl or ethyl.

5,068,353

SYNTHESIS OF AROMATIC BIS(ETHER PHTHALIMIDE) COMPOUNDS

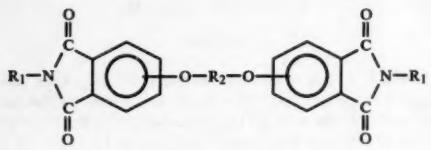
Brent A. Dellacoletta, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1986, Ser. No. 947,909

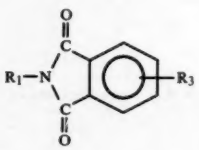
Int. Cl.[5] **C07D** *209/48*

U.S. Cl. 548—461 **31 Claims**

1. A method of synthesizing an aromatic bis(ether phthalimide of the formula (I):



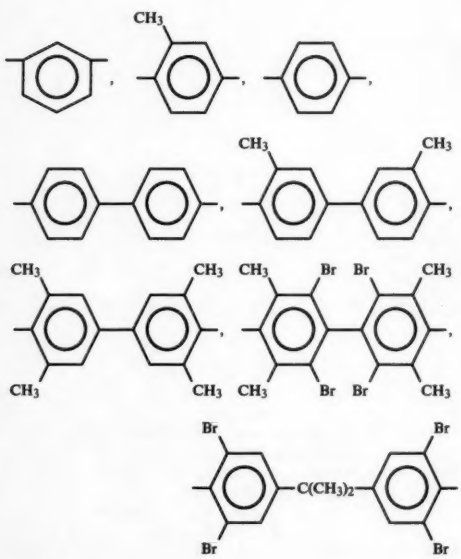
comprising reacting a phthalimide of the formula (II):



with a stoichiometric molar excess of an alkali metal diphenoxide salt of the formula (III):

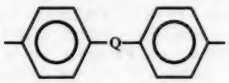
M—O—R_2—O—M

in the presence of a catalytic amount of a phase transfer catalyst, in an anhydrous nonpolar organic solvent under etherforming conditions, then performing a solid-liquid separation technique on the reaction mixture at a temperature at which the compound of formula (I) is substantially completely soluble while alkali metal salts of impurities are substantially insoluble in said organic solvent, and recovering the compound of formula (I) from the liquid phase, wherein R_1 is selected from the group consisting of hydrogen; a lower alkyl group having from 1 to about 10 carbon atoms; and an aromatic hydrocarbon radical or chloro- or bromo-substituted aromatic hydrocarbon radical thereof, having from about 6 to about 20 carbon atoms; R_2 is a divalent organic radical selected from the group consisting of:

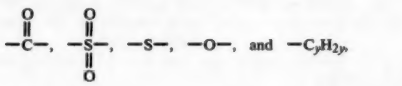


and divalent organic radicals of the general formula:

(I)



where Q represents a member selected from the class consisting of:



where y is a whole number from 1 to about 5; M is an alkali metal-ion; and R_3 is a leaving group.

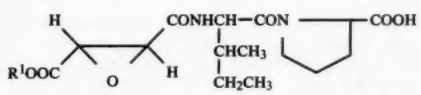
5,068,354

EPOXYSUCCINIC ACID DERIVATIVES

Mitsuo Murata, Konosu; Chihiro Yokoo, Gyoda, and Kazunori Hanada, Ageo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed May 2, 1990, Ser. No. 517,687
Claims priority, application Japan, May 18, 1989, 1-124753
Int. Cl.[5] C07D *405/12*
U.S. Cl. 548—517 **5 Claims**

1. An epoxysuccinic acid derivative represented by the formula



wherein R^1 is a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, and a pharmaceutically acceptable salt.

5,068,355

SEMI-CONDUCTING OLIGOMERS AND METHOD RELATING THERETO

James P. Albarella, and Nan-Horng Lin, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Division of Ser. No. 331,345, Mar. 31, 1989, Pat. No. 5,021,586.
This application Oct. 4, 1990, Ser. No. 592,814
Int. Cl.[5] C07D *207/30, 409/04*
U.S. Cl. 548—527 **2 Claims**

1. Methyl 4-{2′-thienyl-5′-[2″-pyrrolyl-3″-(4-carbomethyoxy-1-oxypropyl)-5″-(2″-thienyl)]}-4-oxobutyrate.

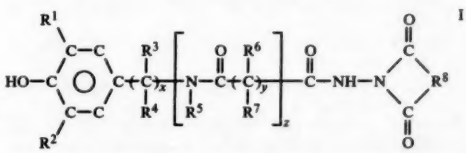
5,068,356

HINDERED PHENOLIC N-(AMIDO)IMIDES

Jerome Wicher, West Seneca, N.Y., assignor to Atochem North America, Inc., Philadelphia, Pa.

Filed Feb. 20, 1990, Ser. No. 481,940
Int. Cl.[5] C07D *209/56, 209/46, 207/408, 207/448*
U.S. Cl. 548—546 **4 Claims**

1. A compound having the following Formula I:

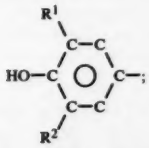


wherein

R^1 is t-alkyl of 4 to 8 carbons or cycloalkyl of 3 to 6 carbons;

R^2 is hydrogen, alkyl of 1 to 8 carbons, t-alkyl of 4 to 8 carbons or cycloalkyl of 3 to 6 carbons;

R^3 is hydrogen, lower alkyl of 1 to 6 carbons, phenyl or a phenol having the formula



R^4, R^5, R^6 and R7 are independently hydrogen, lower alkyl of 1 to 6 carbons or phenyl;

R^8 is a substituted or unsubstituted aliphatic diradical of 2 to 64 carbons, a substituted or unsubstituted alicyclic diradical of 3 to 12 carbons or a substituted or unsubstituted alibicyclic diradical of 5 to 18 carbons, with the proviso that the R^8 diradical has valence locants on adjacent carbons; wherein substituents for R^8 are alkyl of 1 to 24 carbons, alkoxy of 1 to 24 carbons, alkylthio of 1 to 24 carbons, alkenyl of 2 to 24 carbons, oxydialkyl of 2 to 24 carbons, thiodialkyl of 2 to 24 carbons, acyloxy of 2 to 24 carbons, alkoxycarbonyl of 2 to 24 carbons, cycloaliphatic of 3 to 12 carbons, dialkylaminocarbonyl of 3 to 41 carbons or phenyl;

x is an integer from 0 to 6;

y is an integer from 0 to 10; and

z is 0 or 1.

4. The compound according to claim 1 wherein the compound is selected from the group consisting of:

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-2-octadecylsuccinimide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-2-hexadecylsuccinimide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-2-dodecylsuccinimide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-2-octylsuccinimide,

N-[3,3-bis(3'-t-butyl-4'-hydroxyphenyl)butanamido]-2-octadecylsuccinimide,

N-[2-(3,5-di-t-butyl-4-hydroxyphenylamino)-2-oxoacetamido]-2-octadecylsuccinimide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-2-isododecenylsuccinimide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanimido]-5-norbornene-2,3-dicarboximide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-methyl-5-norbornene-2,3-dicarboximide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-4-methylhexahydrophthalimide,

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanamido]-2-tetradecylsuccinimide and

N-[3-(3,5-di-t-butyl-4-hydroxyphenyl)propanmido]maleimide.

5,068,357

PREPARATION OF N-SUBSTITUTED MALEIMIDES BY USE OF TIN CATALYSTS

Ryuichiro Tsumura; Teruo Muraishi, both of Yokohama; Keiichi Ideda, Chigasaki, and Jin-Kai Wang, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 536,366

Claims priority, application Japan, Jun. 16, 1989, 1-152432; Apr. 26, 1990, 2-108769

Int. Cl.[5] C07D *207/42, 403/06, 403/10, 403/12*

U.S. Cl. 548—548 **20 Claims**

1. In a process for the preparation of an N-substituted maleimide by heat-dehydrating an N-substituted maleamic acid in a solvent mixture containing an organic solvent capable of forming water azeotrope and an organic aprotic polar solvent and simultaneously conducting a dehydrating imidization reaction under azeotropic distillation of the reaction generated water, the improvement which comprises conducting the dehydrating imidization in the absence of an acid catalyst and in the presence of one or more catalyst selected from the group consisting of metallic tin, tin oxide, a tin salt of the maleamic acid and a tin compound which forms a tin salt of the maleamic acid in the reaction system.

5,068,358

PROCESS FOR EXTRACTING N-METHYL-2-PYRROLIDONE

Georg-Emerich Miess, Königstein/Taunus; Karl-Heinz Schwarz, Liederbach; Heribert Tetzlaff, Frankfurt am Main, and Bernhard Wojtech, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 11, 1989, Ser. No. 419,687

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1988, 3834904

Int. Cl.[5] C07D *207/267*

U.S. Cl. 548—555 **17 Claims**

1. A process for extracting N-methyl-2-pyrrolidone from an aqueous solution which comprises:

using, as the extractant, a substituted phenol which is insoluble or sparingly soluble in water at room temperature and is monosubstituted or polysubstituted on the aromatic nucleus by one or more straight-chain or branched aliphatic radicals, said substituted phenol being optionally mixed with an inert diluent, the aliphatic substituent or substituents being selected so as to provide a substituted phenol with a boiling point which is above the boiling point of N-methyl-2-pyrrolidone, provided that the aliphatic substituent, or all the aliphatic substituents in total, has or have not more than 16 carbon atoms.

5,068,359

MICROBICIDAL COMPOSITIONS

Alica Huxley, Binningen; Walter Kunz, Oberwil; Peter Ackermann, Pfeffingen, and Marius Sutter, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

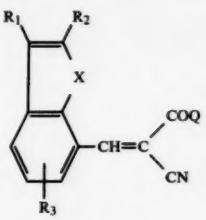
Filed Jun. 12, 1990, Ser. No. 537,196

Claims priority, application Switzerland, Jun. 20, 1989, 2299/89

Int. Cl.[5] C17D *333/72, 307/78*

U.S. Cl. 549—58 **2 Claims**

1. A compound of formula IIa



(IIa)

wherein X is oxygen or sulfur, R_1 is hydrogen, halogen, C_1–C_4alkyl or C_1–C_4haloalkyl, R_2 is hydrogen, halogen, C_1–C_4alkyl or C_1–C_4haloalkyl, R_3 is hydrogen, C_1–C_4alkyl or halogen and Q is OR_{16} or NH_2 where R_{16} is hydrogen or C_1–C_4-alkyl.

5,068,360

PREPARATION OF 2-(2'-THIENYL)ETHYLAMINE DERIVATIVES AND SYNTHESIS OF THIENO(3,2-C)PYRIDINE DERIVATIVES THEREFROM

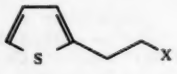
Bradley S. DeHoff, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 25, 1990, Ser. No. 470,299

Int. Cl.[5] C07D *333/26, 495/04*

U.S. Cl. 549—74 **15 Claims**

1. A process for making 2-(2'-thienyl)ethylamine comprising contacting a compound of the formula



where X is a leaving group; with gaseous ammonia in the presence of a compound of the formula M—Y, where:

M is Li, K, Mg, Zn, Na; and

Y is halo or CO_3.

5,068,361

PREPARATION OF CAPROLACTONE

Wolfgang Richter, Wachenheim; Rolf Fischer, Heidelberg, and Uwe Vagt, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 365,126, Jun. 12, 1989, abandoned. This application Sep. 20, 1990, Ser. No. 587,155

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823213

Int. Cl.[5] C07D *309/10*

U.S. Cl. 549—273 **5 Claims**

1. A process for the preparation of caprolactone which comprises: passing a C_1–C_4 alkyl 6-hydroxycaproic ester in vapor form, together with an inert carrier gas, at from 150° to 450° C., over a fixed-bed or fluidized-bed oxidic catalyst, wherein the catalyst used is silica, titanium dioxide or a mixture thereof.

5,068,362

CYCLIC ETHERS AND THEIR UTILIZATION AS PERFUMING OR FLAVORING INGREDIENTS

Anthony F. Morris, Gingins; Regula Naef, Carouge; Sina Escher, Confignon, all of Switzerland, and Alain Velluz, La Roche/Foron, France, assignors to Firmenich SA, Geneva, Switzerland

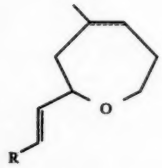
Division of Ser. No. 439,406, Nov. 21, 1989, Pat. No. 5,021,402. This application Dec. 5, 1990, Ser. No. 623,146

Claims priority, application Switzerland, Nov. 28, 1988, 4414/88

Int. Cl.[5] C07D *325/00*

U.S. Cl. 549—346 **5 Claims**

1. A compound of formula



(I)

wherein the dotted line indicates the location of a single or double bond and the symbol R stands for an isopropenyl radical or a 1-ethoxy-1-methylethyl radical.

5,068,363

CYCLOHEXENYLMETHLOXABICYCLOOCTANES, PROCESSES FOR PREPARING SAME, INTERMEDIATES USED IN SAID PROCESSES AND ORGANOLEPTIC USES OF SAID CYCLOHEXENYLMETHLOXABICYCLOOCTANES AND INTERMEDIATES THEREFOR

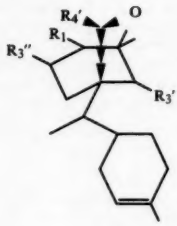
Anubhav P. S. Narula, Hazlet, and John J. De Virgilio, Freehold, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

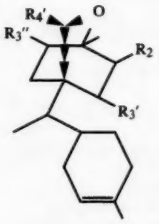
Filed Sep. 27, 1990, Ser. No. 588,733

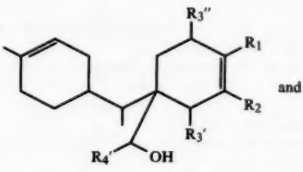
Int. Cl.[5] C07D *313/06*

U.S. Cl. 549—355 **4 Claims**

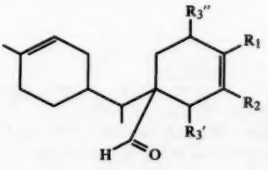
1. A cyclohexenylmethyloxabicyclooctane or intermediate therefor defined according to the structures selected from the group consisting of:







and



wherein R_1, R_2, R_3' and R_3'' each represents hydrogen or methyl with the provisos:

(i) one or both of R_1 and R_2 is methyl;

(ii) when R_1 and R_2 are both methyl, then R_3' and R_3'' are each hydrogen;

(iii) one of R_3' and R_3'' is methyl and the other is hydrogen or R_3' and R_3'' are both hydrogen; and

(iv) when R_3' or R_3'' is methyl then R_1 is methyl and R_2 is hydrogen;

5,068,364

CHALCONE DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Hidetsugu Takagaki; Shigenori Nakanishi, both of Sakura; Masayoshi Abe, Chiba; Hiromi Ohki, and Yoshiyuki Sano, both of Sakura, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

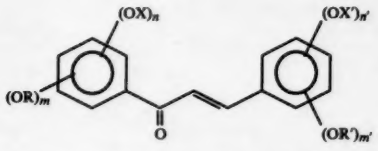
Filed Nov. 21, 1989, Ser. No. 439,435

Claims priority, application Japan, Nov. 21, 1988, 63-292436

Int. Cl.[5] C07D *309/12*

U.S. Cl. 549—415 18 Claims

1. A hydroxychalcone derivative represented by general formula (I)



(I)

wherein X and X′ each represent 2-tetrahydropyranyl, R and R′, which are the same or different, each represent and alkyl group or a hydrogen atom, n and n′ each is an integer of from 0 to 3, m and m′ are each integers of from 0 to 3, provided that n+n′ is 1 or more, and than n+m is an integer of from 1 to 3 and n′+m is an integer of from 1 to 3.

5,068,365

HEXAHYDROPHTHALIC ANILIDE DERIVATIVES

Takumi Tokunaga; Hiroyuki Watanabe; Kenji Tsuzuki, all of Yamaguchi; Sinzo Someya, Saitama; Seigo Koura, Tokyo, and Mikio Ito, Yamaguchi, all of Japan, assignors to Tosoh Corporation, Yamaguchi and Agro-Kanesho Co., Ltd., Tokyo, both of, Japan

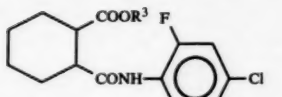
Filed Dec. 30, 1988, Ser. No. 292,077

Claims priority, application Japan, Dec. 31, 1987, 62-336452; Sep. 7, 1988, 62-222256; Sep. 8, 1988, 63-225462; Sep. 19, 1988, 63-234259

Int. Cl.[5] C07C *69/75;* C07D *307/16*

U.S. Cl. 549—496 8 Claims

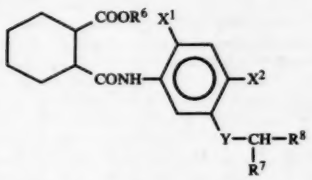
1. A hexahydrophthalic anilide derivative of the formula [I]:



[I]

wherein R^1 represents non-substituted or substituted phenyl, R^2 represents hydrogen or C_1–C_4 alkyl, R^3 represents C_1–C_4 alkyl or C_1–C_4 alkenyl.

4. A hexahydrophthalic anilide derivative of the formula:



[III]

wherein X^1 and X^2, the same or different, represent halogen Y, represents oxygen or sulfur, R^6 represents C_1–C_6 straight alkyl group which is substituted with a C_1–C_3 alkoxy group, tetrahydrofurfuryl or 2-perhydropyranylmethyl, R^7 represents hydrogen or methyl, R^8 represents cyano, C_1–C_3 alkyl, C_2 or C_3 alkenyl, C_2–C_4 alkynyl, C_3–C_6 alkynyl which is substituted with methoxy, $CONHR^9$, wherein R^9 represents aromatic sulfonyl, or an azole heterocyclic ring.

5,068,366

SIMULTANEOUS EPOXIDE AND CARBOXYLIC ACID MANUFACTURE BY CO-OXIDATION IN THE PRESENCE OF A COBALT CATALYST

John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,237

Int. Cl.[5] C07D *301/06;* C07C *51/21*

U.S. Cl. 549—533 8 Claims

1. A co-oxidation process for simultaneously producing isobutylene oxide and isobutyric acid comprising:

contacting a mixture of isobutylene and isobutyraldehyde in the liquid phase with oxygen in the presence of a soluble cobalt salt catalyst and in the presence of an organic, inert solvent.

5,068,367

TETRACYANO-1,4-HYDROQUINONE AND TETRACYANO-1, 4-BENZOQUINONE

Carlos Vazquez, Newark, Del., and Joel S. Miller, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1990, Ser. No. 472,920

Int. Cl.[5] C07C *50/02, 50/38*

U.S. Cl. 552—310 22 Claims

1. A process for the preparation of tetracyano-1,4-benzoquinone comprising:

(a) reacting tetracyano-1,4-hydroquinone with an excess of a silver salt to yield the disilver salt of tetracyano-1,4-hydroquinone; and

(b) reacting said disilver salt with an oxidizing agent to yield tetracyano-1,4-benzoquinone.

10. A process for the preparation of tetracyano-1,4-benzoquinone comprising:

(a) reacting tetracyano-1,4-hydroquinone with a tetra-alkyl or tetra-aryl ammonium salt to yield the corresponding ammonium salt of tetracyano-1,4-hydroquinone.

(b) reacting said ammonium salt with an excess of a silver salt to yield the disilver salt of tetracyano-1,4-hydroquinone; and

(c) reacting said disilver salt with an oxidizing agent to yield tetracyano-1,4-benzoquinone.

5,068,368

STABILIZED LITHIUM ACETYLIDE AND REACTIONS THEREWITH

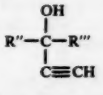
W. Novis Smith, and Christopher Louer, both of Philadephia, Pa., assignors to Cyprus Foote Mineral Company, Malvern, Pa.

Filed May 10, 1990, Ser. No. 521,743

Int. Cl.[5] C07J *7/00, 75/00;* C07C *29/143;* C07F *1/02*

U.S. Cl. 552—556 12 Claims

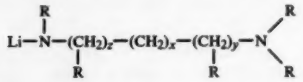
1. In a process for the preparation of ethynyl carbinols of the formula:

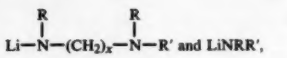


wherein R″ is hydrogen or lower alkyl, R‴ is hydrogen, alkyl, a substituted or unsubstituted aliphatic, alicyclic or monocyclic

or bicyclic aromatic hydrocarbon or R'' and R''' together to the carbon atom to which they are joined represent a steroid, which comprises the steps of

A. reacting in a solvent system at least one lithium alkylamide selected from the group consisting of:





wherein R is a hydrogen or lower alkyl, R' is hydrogen, lower alkyl, a substituted or unsubstituted aliphatic, alicyclic or monocyclic or bicyclic aromatic hydrocarbon, x is an integer of 2 to 8, y and z are each 0 to 1, with acetylene to form a monolithium acetylide

B. reacting in a solvent system the monolithium acetylene from Part A with a ketone of the formula R''R''' C=O, wherein R'' and R''' are as hereinbefore defined, and then

C. hydrolysing the reaction product of Part B to form the corresponding ethynyl carbinol compound, the improvement comprising the solvent system in Parts B comprises a moncyclic aromatic solvent in an amount sufficient to solubilize said lithium alkylamide and to effect a stable solution.

5,068,369

PROCESS FOR PREPARING CHIRAL SULPHOXIDES

Stephen G. Davies, Oxford, England, assignor to The British Petroleum Company p.l.c., London, England

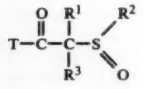
Division of Ser. No. 311,819, Feb. 17, 1989. This application Sep. 28, 1990, Ser. No. 589,502

Claims priority, application United Kingdom, Feb. 24, 1988, 8804339; Nov. 8, 1988, 8826144

Int. Cl.[5] C07F *15/02*

U.S. Cl. 556—16 **8 Claims**

1. A chiral sulphoxide having the formula:



wherein

T is the moiety (Cp)Fe(CO) (Z)-where Cp is (eta^5-C_5H_5) or a C_1 to C_3 alkyl substituted derivative thereof, and Z is a ligand having the formula $(R^4)_2X\ R^5$ in which X is either phosphorus or arsenic, the R^4 groups are either phenyl or phenoxy groups and R^5 is selected from the group consisting of phenyl groups, phenoxy groups, and functionalized or unfunctionalized C_1 to C_{12} alkyl or alkoxy groups;

R^1 and R^2 are independently selected from the group consisting of C_1 to C_{12} alkyl, C_6–C_{10} aryl and vinyl groups; and

R^3 is selected from the group consisting of hydrogen, C_1 to C_{12} alkyl, C_6 to C_{10} aryl and vinyl groups.

5,068,370

MONOMERIC ORGANOMETALLIC COMPOUNDS AND METHOD OF PREPARING SAME

Kelvin T. Higa, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1990, Ser. No. 534,997

Int. Cl.[5] C07F *9/00, 5/00*

U.S. Cl. 556—19 **13 Claims**

1. Compounds having the formula $(t\text{-}Bu)_2ME(t\text{-}Bu)_2$, where,

M is selected from the group consisting of Ga, Al, and In, and where,

E is selected from the group consisting of As, P, Sb, and N.

5,068,371

NITROGEN-CONTAINING TITANOCENES, AND THE USE THEREOF

Eginhard Steiner, Füllinsdorf; Harry Beyeler, Basel, and Rinaldo Hüsler, Wünnewil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1990, Ser. No. 527,989

Claims priority, application Switzerland, Jun. 1, 1989, 2075/89

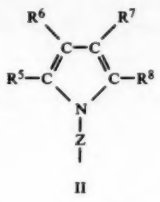
Int. Cl.[5] C07F *7/28; G03C 1/68*

U.S. Cl. 556—53 **16 Claims**

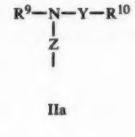
1. A titanocene of the formula I

I

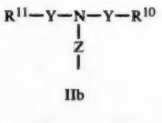
in which both the R^1 radicals, independently of one another, are cyclopentadienyl$^{\ominus}$, indenyl$^{\ominus}$or 4,5,6,7-tetrahydroindenyl$^{\ominus}$, each of which is unsubstituted, monosubstituted or polysubstituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy, C_2–C_{18}alkenyl, C_5–C_8cycloalkyl, C_6–C_{16}aryl, C_7–C_{16}aralkyl, —$Si(R^4)_3$, —$Ge(R^4)_3$, cyano or halogen, and R^4 is C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, C_6–C_{10}aryl or C_7–C_{16}aralkyl, R^2 is a 6-membered carbocyclic or 5- or 6-membered heterocyclic aromatic ring which is substituted by fluorine atoms at least in the two ortho-positions to the titanium-carbon bond, and in which the aromatic ring may contain further substituents, and R^3, independently, is as defined for R^2, R^2 and R^3 in the titanocenes being substituted by a radical of the formula II, IIa or IIb



II



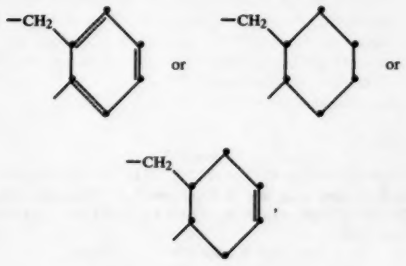
IIa



IIb

in which R^5, R^6, R^7 and R^8, independently of one another, are hydrogen or linear or branched C_1–C_{18}alkyl, C_2–C_5alkenyl, C_7–C_9aralkyl, C_7–C_9alkaryl, C_8–C_{10}alkaralkyl, C_6–C_{10}aryl, 2-furyl, C_5–C_8cycloalkyl, C_5–C_8cycloalkenyl, C_2–C_{12}alkanoyl, C_2–C_{12}alkoxycarbonyl, —CHO, —$Si(R^4)_3$ or —$Ge(R^4)_3$, these radicals being unsubstituted or substituted by C_2–C_8-dialkylamino, bis[2-(C_1–C_4alkoxy)ethyl]amino, morpholino, piperidino, N-methylpiperazino, pyrrolidino, quaternary C_3–C_{10}trialkylammonium, C_1–C_{12}alkoxy, $-(OCH_2CH_2)_p$ OC-$_1$–C_{16}alkyl, in which p is a number from 1 to 20, 1,3-dioxolan-2-yl, 4-methyl-1,3-dioxolan-2-yl, —OCH_2CH_2O—, C_2–C_{12}alkoxycarbonyl, C_2–C_{12}alkanoyloxy, C_2–C_{12}alkanoyl, C_1–C_{12}alkylthio, halogen, cyano or —$Si(R^4)_3$, or R^5 and R^6 and/or R^7 and R^8 or R^6 and R^7 are each together —$(CH_2)_3$—, —$(CH_2)_4$—, —CH=CH—CH=CH—, —CH=CH—C(R^{12})=CH—, —CH_2OCH_2— or —$CH_2N(C_1$–C_4alkyl)CH_2—, in which R^{12} is hydroxyl, C_1–C_4alkoxy or C_2–C_4alkanoyloxy, Y is a —CO—, —CS—, —COO—, —SO_2— or —$Si(R^4)_2$— group, R_9 is hydrogen, linear or branched C_1–C_{20}alkyl, C_2–C_{20}alke-

nyl, C_3–C_8cycloalkyl, C_4–C_{20}cycloalkylalkyl, C_4–C_{20}alkylcycloalkyl, C_5–C_{20}alkylcycloalkylalkyl, C_6–C_{20}cycloalkenylalkyl, C_6–C_{14}aryl, C_7–C_{20}aralkyl, C_7–C_{20}alkaryl, C_8–C_{20}alkaralkyl or C_3–C_{12}trialkylsilyl, these radicals being unsubstituted or substituted by C_1–C_{18}alkoxy, C_1–C_{18}alkylthio, C_1–C_{18}alkylsulfonyl, C_6–C_{10}arylsulfonyl, C_7–C_{20}alkarylsulfonyl, 2-tetrahydrofuranyl or cyano, R^{10} has one of the meanings given for R^9 or is C_1–C_{20}haloalkyl, C_2–C_{20}alkyl which is interrupted by —CO—, or is C_1–C_{12}alkyl which is substituted by —COOH or —$COOR^4$, and in the case where Y is —CO—, —CS— or —SO_2—, may alternatively be —$NR^{13}R^{14}$ in which R^{13} and R^{14}, independently of one another, have one of the meanings given for R^9, or R^{13} and R^{14} together are C_3–C_7alkylene which may be interrupted by —O—, —S— or —$N(R^{15})$—, in which R^{15} is hydrogen, C_1–C_{12}alkyl, C_3–C_{12}alkenyl, C_7–C_{12}aralkyl or C_2–C_{20}alkanoyl, or R^9 and R^{10} together are linear or branched C_2–C_8alkylene or C_2–C_8alkylene which is substituted by halogen, C_1–C_4alkoxy, allyloxy or —$NR^{13}R^{14}$, or are a divalent radical of the formula



R^{11} has one of the meanings given for R^{10}, or R^{11} and R^{10} together are C_1–C_8alkanediyl, C_2–C_8alkenediyl, C_6–C_{14}arenediyl, C_4–C_{12}cycloalkanediyl, C_5–C_{12}cycloalkenediyl, C_6–C_{14}cycloalkadienediyl, C_7–C_{20}bicycloalkanediyl, C_7–C_{20}bicycloalkenediyl, or C_2–C_4alkanediyl which is interrupted by —O—, —S— or —$N(R^{15})$—, these radicals being unsubstituted or substituted by one or more of the substituents halogen, C_1–C_{10}alkoxy, C_1–C_{20}alkyl, C_3–C_{20}alkenyl or C_6–C_{14}aryl, and Z is C_1–C_{20}alkanediyl which is unsubstituted or substituted by —$COOR^4$, —CN or halogen.

5,068,372

METHOD FOR THE SYNTHESIS OF PRIMARY ARSINES

Ravindra K. Kanjolia, North Andover, and Benjamin C. Hui, Peabody, both of Mass., assignors to CVD Incorporated, Woburn, Mass.

Filed Jul. 16, 1990, Ser. No. 556,787

Int. Cl.[5] C07F 9/66

U.S. Cl. 556—70 **23 Claims**

1. A method for producing, from an aqueous basic composition, a primary arsine having one hydrocarbyl group bonded directly to As, said basic composition obtained from the combination of components comprising an alkali metal arsenite and a reactive hydrocarbyl bromide and/or hydrocarbyl chloride, by directly combining said aqueous composition with a nascent hydrogen-generating reducing agent to produce said primary arsine directly from said aqueous composition.

5,068,373

METHOD FOR THE PREPARATION OF ANHYDROUS TIN-(IV)-CARBOXYLATES

Erich Ruf, Essen-Haarzopf, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jan. 29, 1991, Ser. No. 647,403

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1990, 4003488

Int. Cl.[5] C07F 7/22

U.S. Cl. 556—105 **6 Claims**

1. A method for the production of anhydrous tin-(IV)-acetate which comprises reacting metallic tin in powder form or Sn-(II)-acetate with an excess amount of acetic acid anhydride while stirring and at temperatures of about between 50° to 150° C. and while passing oxygen through the reaction mixture or adding an oxygen yielding agent to the reaction mixture, whereby tin-(IV)-acetate is formed, and separating the tin-(IV)-acetate from the reaction mixture.

2. A method for the preparation of anhydrous tin-(IV)-carboxylate which comprises:

(a) preparing a reaction mixture of metallic tin or Sn-(II)-acetate and an excess amount of acetic acid anhydride, stirring the reaction mixture at a temperature ranging from about between 50° to 150° C. while passing oxygen through the reaction mixture or adding an oxygen yielding agent to the reaction mixture to form tin-(IV)-acetate;

(b) separating the tin-(IV)-acetate thus obtained from the reaction mixture;

(c) reacting the tin-(IV)-acetate with a carboxylic acid having more than four carbon atoms or the corresponding acid anhydride at a temperature ranging from about between 80° to 150° C. to form anhydrous tin-(IV)-carboxylate; and

(d) removing from the reaction mixture liberated acetic acid or acetic acid anhydride by distillation under vacuum conditions.

5,068,374

METHOD FOR THE PREPARATION OF ANHYDROUS TIN-DICARBOXYLATE-DIHALIDES

Erich Ruf, Essen-Haarzopf, Fed. Rep. of Germany, assignor to T. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jan. 29, 1991, Ser. No. 647,402

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005135

Int. Cl.[5] C07F 7/22

U.S. Cl. 556—105 **7 Claims**

1. A method of preparing anhydrous tin-diacetate-dihalide which comprises reacting anhydrous tin-(II)-halide with an excess amount of acetic acid anhydride at a temperature of about between 20° to 100° C. while passing oxygen through the reaction mixture or adding an oxygen yielding agent to the reaction mixture and separating the tin-diacetate-dihalide thus formed.

3. A method for the preparation of anhydrous tin-dicarboxylate-dihalide which comprises:

(a) preparing a reaction mixture of anhydrous tin-(II)-halide and an excess amount of acetic acid anhydride, passing oxygen or an oxygen yielding agent through the reaction mixture and heating the reaction mixture to a temperature of about between 20° to 100° C. to form tin-diacetate-dihalide;

(b) separating the tin-diacetate-dihalide and reacting it with aliphatic carboxylic acid having more than four carbon atoms or its corresponding acid anhydride at a temperature of about between 80° and 150° C.; and

(c) removing liberated acetic acid anhydride or acetic acid under vacuum conditions.

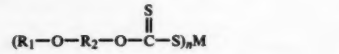
5,068,375

SUBSTITUTED NOBLE METAL XANTHATES

Gopal H. Singhal, Baton Rouge, La., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Oct. 1, 1990, Ser. No. 590,889
Int. Cl.[5] C07F *15/00*
U.S. Cl. 556—136 **16 Claims**

1. A substituted noble metal xanthate composition having the formula:



where

R_1 is an alkyl group, an alkoxy substituted alkyl group, an aryl group, or a substituted aryl group;

R_2 is a straight or branched alkylene group;

M is a noble metal selected from Pt, Rh, and Ir;

n is 2 when M is Pt; and

n is 3 when M is Rh.

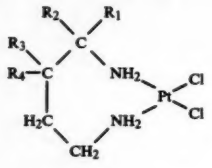
5,068,376

NOVEL PLATINUM COMPLEXES

Hiroyoshi Nowatari; Hiroshi Hayami, both of Takasaki; Yasuo Kuroda, Gunma; Sumio Yoda, Takasaki, and Katsutoshi Takahashi, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 372,248, Jun. 27, 1989, Pat. No. 4,921,984, which is a division of Ser. No. 87,045, Aug. 19, 1987, Pat. No. 4,864,043, which is a continuation of Ser. No. 893,108, Aug. 4, 1986, Pat. No. 4,737,589. This application Jan. 10, 1990, Ser. No. 464,671
Claims priority, application Japan, Aug. 27, 1985, 60-187710; Feb. 12, 1986, 61-26799; Feb. 12, 1986, 61-26800; Apr. 25, 1986, 61-94626; Jul. 1, 1986, 61-152635
Int. Cl.[5] C07F *15/00*
U.S. Cl. 556—137 **9 Claims**

1. A diamine platinum (II) complex represented by the general formula



wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom or a lower alkyl group.

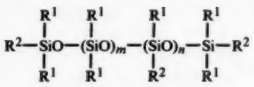
5,068,377

BETAINE-CONTAINING SILOXANE COMPOUNDS AND METHOD FOR MAKING

Hideyuki Kawamoto; Shoji Ichinohe, both of Annaka, and Kazuyuki Tsubone, Hiratsuka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 598,434
Claims priority, application Japan, Oct. 16, 1989, 1-269897
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—418 **18 Claims**

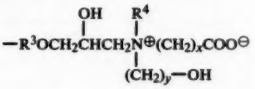
1. A betaine radical-containing siloxane compound having the following formula:



(1)

wherein R^1 is independently selected from substituted or unsubstituted monovalent hydrocarbon radicals having 1 to 18 carbon atoms,

R^2 is independently selected from the group consisting of a substituted or unsubstituted monovalent hydrocarbon radical having 1 to 18 carbon atoms and a monovalent organic radical of the formula:



(2)

wherein R^3 is a divalent hydrocarbon radical having 1 to 10 carbon atoms, R^4 is an alkyl radical having 1 to 3 carbon atoms or $-(CH_2)_y-OH$, letters x and y are integers of from 1 to 3, with the proviso that at least one of R^2 substituents is of formula (2), and

letters m and n are integers of from 0 to 1000.

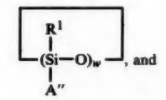
5,068,378

THIOGLYCOLAMIDE-FUNCTIONAL SILOXANES

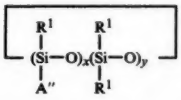
Daniel J. Halloran, and Padmakumari J. Varaprath, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 9, 1990, Ser. No. 462,185
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—420 **3 Claims**

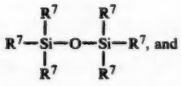
1. Salts of thioglycolamide functional siloxanes selected from the groups comprising cyclic siloxanes of the general formulas



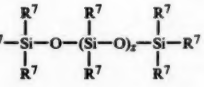
, and



and linear siloxanes of the general formulas



, and



and mixtures thereof; wherein

each R^1 is independently selected from an alkyl group containing 1 to 6 carbon atoms, and an aryl group containing 6 to 10 carbon atoms;

each A" is independently selected from R^1 and a salt of a thioglycolamide functional group with the provision that

at least one A'' group be a salt of a thioglycolamide functional group;

each R^7 is independently selected from A'' and R^1 with the provision that at least one R^2 group be a salt of a thioglycolamide functional group;

w has the value of 3 to 6; x has the value of 1 to 6; y has the value of 1 to 6; and z has the value of 1 to 10; with the provision that the sum of x+y equals at least 3.

5,068,379

METHOD FOR PREPARING SULFONIMIDOYL HALIDES

Aroop K. Roy, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 23, 1991, Ser. No. 644,764
Int. Cl.[5] C07F 7/10
U.S. Cl. 556—422 **11 Claims**

1. A method for preparing a N-triorganosilylsulfonimidoyl halide represented by the formula $R^2{}_3SiN{=}S(O)(R^1)X$, said method comprising reacting a N-triorganosilyl sulfonamide corresponding to the formula $R^1SO_2N(H)_n(SiR^2{}_3)_{(2-n)}$ with a dihalophosphorane corresponding to the formula $R^3{}_3PX_2$, where R^1 is selected from the group consisting of monovalent hydrocarbon and monovalent substituted hydrocarbon radicals and heterocyclic radicals where the hetero atom is oxygen, sulfur or tertiary nitrogen, R^2 is selected from the group consisting of monovalent hydrocarbon and monovalent substituted hydrocarbon radicals, and n is 0 or 1, where R^3 represents an aryl or substituted aryl radical and X is chlorine or bromine, and isolating said N-triorganosilyl-sulfonimidoyl halide.

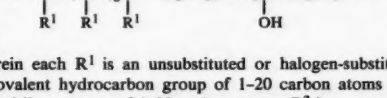
5,068,380

ANIONIC SILICONE SURFACTANT AND METHOD OF ITS MANUFACTURE

Noriyuki Meguriya; Syuuichi Azechi, and Masaki Tanaka, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,492
Claims priority, application Japan, Dec. 15, 1988, 63-316656
Int. Cl.[5] C07F 7/08, 7/10
U.S. Cl. 556—428 **9 Claims**

1. An anionic silicone surfactant represented by the formula



wherein each R^1 is an unsubstituted or halogen-substituted monovalent hydrocarbon group of 1–20 carbon atoms or a trialkylsiloxy group of 1–20 carbon atoms; R^2 is an unsubstituted, halogen-substituted or hydroxyl-substituted bivalent hydrocarbon group of 1–10 carbon atoms, or a corresponding hydrocarbon group wherein no more than $\frac{1}{2}$ of the carbon atoms are replaced by an oxygen atom; M is a Group A alkali metal or $NR^3R^4R^5$, wherein R^3, R^4 and R^5 are a hydrogen atom or a monovalent hydrocarbon group of 1–20 carbon atoms; and a is a number which lies in the range $0 \leqq a \leqq 20$.

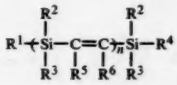
5,068,381

POLY(SILVINYLENE)S AND A PROCESS FOR THEIR PREPARATION

Yoshihiko Ito, and Masahiro Murakami, both of Kyoto, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

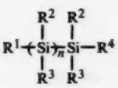
Filed Mar. 11, 1991, Ser. No. 667,266
Claims priority, application Japan, Mar. 13, 1990, 1-62067
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—431 **3 Claims**

1. A process for preparing a poly(silvinylene) represented by the following general formula [III]:



[III]

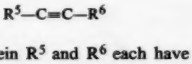
wherein R^1, R^2, R^3, and R^4, which may be the same or different, each represent a member selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms and an alkoxy group having 1 to 6 carbon atoms, R^5 and R^6, which may be the same, each represent a member selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an alkoxycarbonyl group having 2 to 7 carbon atoms, and a trialkylsilyl group the alkyl groups of which have 1 to 10 carbon atoms, and n is an integer characterized in that (A) a polysilane represented by the following general formula [I]:



[I]

wherein R^1, R^2, R^3, R^4, and n each have the same meaning as defined above,

and (B) an acetylene represented by the following general formula [II]:



[II]

wherein R^5 and R^6 each have the same meaning as defined above, are reacted in the presence of a catalyst comprising an isocyanide compound and a palladium compound.

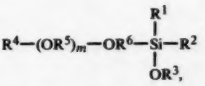
5,068,382

PROCESS FOR THE PRODUCTION OF ORGANOSILICON COMPOUNDS

Hartwig Rauleder, and Hans-Joachim Kötzch, both of Rheinfelden, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 12, 1990, Ser. No. 491,775
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908791
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—495 **8 Claims**

1. The method of preparing an organosilicon compound of the formula



wherein

R^1 and R^2 are each independently straight or branched alkyl of 1 to 4 carbon atoms or $—OR^3$,

R^3 is $R^4—(OR^5)_m—$,

R^4 is straight or branched alkyl of 1 to 4 carbon atoms,

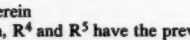
m is an integer from 0 to 6, inclusive,

R^5 is straight or branched alkylene of 2 to 4 carbon atoms, which may be identical or different when m is an integer from 2 to 6, and

R^6 is straight or branched alkylene of 2 to 6 carbon atoms, which comprises subjecting a hydrogensilane of the formula

wherein

R^7 are identical or different groups R^4 or the group OR^4, and R^4 has the previously indicated meaning, to an addition reaction with a terminally unsaturated ether of the formula

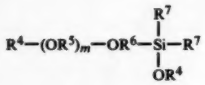


wherein

m, R^4 and R^5 have the previously indiated meanings, and

R^8 is terminally unsaturated straight or branched alkenyl of 2 to 6 carbon atoms,

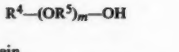
in the presence of a catalyst at a controlled temperature to form an addition product of the formula



wherein

m and R^4, R^5, R^6 and R^7 have the previously indicated meanings, and the R^4's are identical or different,

and converting said addition product by thermal or catalytic transesterification with a monofunctional hydroxy compound of the formula



wherein

m, R^4 and R^5 have the previously indicated meanings, into said organosilicon compound.

5,068,383

CATALYZED REDISTRIBUTION OF POLYORGANOSILOXANES

Jodi A. Bourgoin, Florence; Steven K. Freeburne, Edgewood, both of Ky.; Roland L. Halm, Madison, Ind.; Brian M. Naasz, LaGrange, Ky.; David S. Niswonger, Prospect, Ky., and Dennis G. VanKoevering, Florence, Ky., assignors to Dow Corning Corporation, Midland, Mich.

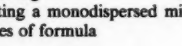
Filed Nov. 9, 1990, Ser. No. 611,216

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—452 **44 Claims**

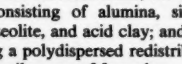
1. A process for the redistribution of chlorosiloxanes, the process comprising:

(A) contacting a monodispersed mixture comprising chlorosiloxanes of formula



where each R is independently selected from a group consisting of hydrogen, and alkyl and substituted alkyl radicals of one to six carbon atoms, and m is an integer from one to 100; with a catalyst which facilitates redistribution of the chlorosiloxane, the catalyst selected from a group consisting of alumina, silica-alumina, activated carbon, zeolite, and acid clay; and

(B) forming a polydispersed redistributed mixture comprising chlorosiloxanes of formula



where R is as previously described and m' is a mean value equivalent to m.

5,068,384

PHOSPHATE SALTS OF AB-POLYBENZOXAZOLE MONOMER

William J. Harris; Zenon Lysenko, both of Midland, and Carl W. Hurtig, Saginaw, all of Mich., assignors to The Dow Chemical, Midland, Mich.

Division of Ser. No. 380,567, Jul. 14, 1989, Pat. No. 4,959,492. This application Jun. 29, 1990, Ser. No. 546,596

Int. Cl.[5] C07C *227/04*

U.S. Cl. 562—453 **10 Claims**

1. A salt comprising AB-PBO monomer ions and phosphate ions wherein at least 99 percent of the organic content of the salt is AB-PBO monomer ions.

5,068,385

PROCESS FOR THE PREPARATION OF ALKYL HALOGENOSILANES

Bruno Degen, Much; Kurt Feldner; Elke Licht, both of Leverkusen, and Gebhard Wagner, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 20, 1990, Ser. No. 570,089

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929865

Int. Cl.[5] C07F *7/16*

U.S. Cl. 556—472 **4 Claims**

1. A process for the preparation of alkyl halogenosilanes comprising reacting silicon with an alkyl halide in the presence of a copper catalyst and promoter substances and phosphorus and phosphorus compounds in combination with indium or indium compounds or aluminum or aluminum compounds or a mixture of aluminum or aluminum compounds and indium or indium compounds.

5,068,386

PREPARATION OF TERTIARY-HYDROCARBYLSILYL COMPOUNDS

Akihiko Shirahata, Yotsukaido, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

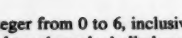
Filed Jun. 1, 1990, Ser. No. 531,617

Claims priority, application Japan, Jun. 28, 1989, 1-165760

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—480 **12 Claims**

1. A method for preparation of tertiary-hydrocarbylsilyl compounds comprising reacting a Grignard reagent of formula



wherein R is a tertiary-hydrocarbyl group and X is a halogen atom;

with a silicon compound of formula

wherein R^1 is a substituted or unsubstituted monovalent hydrocarbon group, X is a halogen atom, and a is an integer with a value of zero to three;

in the presence of a cyano compound or thiocyanate compound.

5,068,387

PRODUCTION OF ORGANOFUNCTIONAL ALKOXYSILANES

Don L. Kleyer, Hemlock, and John L. Speier, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 1, 1989, Ser. No. 444,345
Int. Cl.[5] C07F 7/08, 7/10, 7/18
U.S. Cl. 556—485 7 Claims

1. An organofunctional alkoxysilane of formula

$$R^1_aR^2_b(AR)_nSi(OR^3)_{4-a-b-n};$$

where R^1 and R^2 are independently selected from the group consisting of alkyl, aryl, and AR radicals; R^3 is an alkyl of 1 to 7 carbon atoms; A is a substituent on an organic group, R, said A selected from the group consisting of R^4O—, C_zF_{2z+1}—, and alkenyl radicals; R^4 and R^5 are independently selected from the group consisting of alkyl, aryl, and triorganosilyl radicals; z is 1 to 4; R is a divalent radical of the structure $—R^6(CH_2)_m—$, R^6 is selected from a group consisting of aliphatic and aromatic divalent radicals; m=0 to 6; n=2 or 3; a+b+n=2 or 3; and a+b=0 or 1.

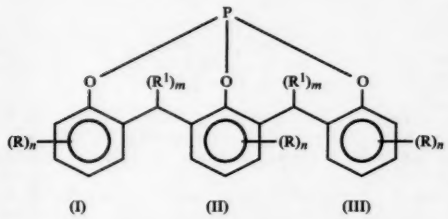
5,068,388

BICYCLICTRIARYLPHOSPHITE ANTIOXIDANT

Vincent J. Gatto, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 4, 1990, Ser. No. 532,882
Int. Cl.[5] C07F 9/6574
U.S. Cl. 558—74 7 Claims

1. A bicyclictriarylphosphite corresponding to the formula:



(I) (II) (III)

wherein R^1 is methyl, each R is independently selected from methyl and tert-butyl, m is 0 or 1, and n is an integer of 1-3.

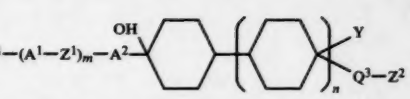
5,068,389

TERTIARY ALCOHOLS

Andreas Wächtler, Griesheim; Rudolf Eidenschink, Mühltal; Joachim Krause, Dieburg, and Hans-Adolf Kurmeier, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

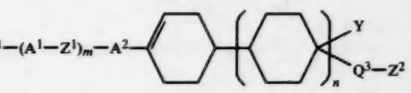
PCT No. PCT/EP87/00132, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO87/05599, PCT Pub. Date Sep. 24, 1987
Continuation of Ser. No. 133,109, filed as PCT/EP87/00132 on Mar. 7, 1987, published as WO 87/05599 Sep. 24, 1987, abandoned.
This PCT application Mar. 7, 1987, Ser. No. 518,254
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608502; Feb. 3, 1987, 3703145
Int. Cl.[5] C07C 255/00; C09K 19/52
U.S. Cl. 558—411 9 Claims

1. A tertiary alcohol of the Formula I



I

and the corresponding dehydrated compounds of the Formula IV



IV

wherein
R^1 is halogen, or if n—1, m=1 or both n and m=1, R^1 can also be alkyl having 1-15 C atoms in which one CH_2 group can be replaced by O, —CO—, —CO—O—, or —CH=CH—;
A^1 is 1,4-phenylene or 1,4-cyclohexylene which is unsubstituted or monosubstituted or polysubstituted by halogen, CH_3, or combinations thereof;
Z^1 is $—CH_2CH_2—$, $—CH_2O—$, $—OCH_2—$, or a single bond;
m is 0, 1, or 2;
n is 0 or 1;
A^2 is 1,4-phenylene which is unsubstituted, substituted or monosubstituted or polysubstituted by halogen, CH_3, or combinations thereof;
Z^2 is —COOR or —CN;
Q^3 is alkylene having 1-15 C atoms, alkylidene having 2-14 C atoms, or a single bond;
Y is H, CN, or R; and
R is alkyl having 1-15 C atoms
and metal alcoholates of the compounds of Formula I.

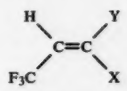
5,068,390

1,1,1-TRIFLUORO-2-PROPENE COMPOUNDS

David G. Kuhn, Newtown, Pa., and Kenneth A. M. Kremer, Lawrenceville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 31, 1990, Ser. No. 560,403
Int. Cl.[5] C07C 225/10, 69/63, 53/21, 49/04
U.S. Cl. 558—461 4 Claims

1. A compound having the structure:



wherein
X is Cl, Br or I;
Y is CN or $C(O)R_1$;
R_1 is hydrogen or C_1-C_4 alkyl; and the cis and trans isomers thereof.

5,068,391

PREPARATION OF METHYLENEDI (PHENYLURETHANE)

Michel Gubelmann; Christophe Rochin, both of Lyons, and Christian Allandrieu, Villeurbanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 29, 1990, Ser. No. 545,547
Claims priority, application France, Jun. 29, 1989, 89 09002
Int. Cl.[5] C07C 125/073
U.S. Cl. 560—25 14 Claims

1. A process for the preparation of methylenedi(phenylurethane), comprising rearranging at least one bis-(N-carboalkox-

yanilino)methane in the presence of an effective amount of hydrofluoric acid.

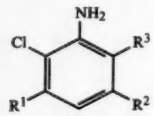
5,068,392

PROCESS FOR THE PREPARATION OF 2-CHLORO AND 2,6-DICHLOROANILINES

Lennon H. McKendry, and Mark W. Zettler, both of Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Jan. 24, 1991, Ser. No. 645,176
Int. Cl.[5] C07C *229/00*
U.S. Cl. 560—46 **11 Claims**

1. A process for preparing 2-chloro and 2,6-dichloroanilines of the formula (I):



(I)

wherein

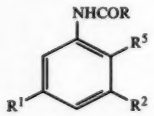
R^1 and R^2 are independently H, C_1–C_4 alkyl, C_1–C_4 alkoxy or Cl, and

R^3 is Cl, CO_2R^4, CN or $CONH_2$, where

R^4 is H, C_1–C_4 alkyl or phenyl,

which comprises the following steps:

(a) brominating an anilide of the formula (II):



(II)

wherein

R is CH_3, CH_2CH_3 or CF_3,

R^5 is H, CO_2R^4, CN or $CONH_2$, and

R^1, R^2 and R^4 are as previously defined, to give a 4-bromoanilide of the formula (III):

(III)

wherein

R, R^1, R^2 and R^5 are as previously defined:

(b) chlorinating the 4-bromoanilide (III) of step (a) to give a 2-chloro or 2,6-dichloro-4-bromoanilide of the formula (IV):

(IV)

wherein

R, R^1, R^2 and R^3 are as previously defined; and

(c) and (d) reducing and hydrolyzing the 2-chloro or 2,6-dichloro-4-bromoanilide (IV) of step (b) to give the 2-chloro or 2,6-dichloroaniline (I).

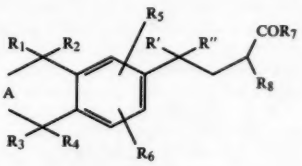
5,068,393

AROMATIC DERIVATIVES OF BUTYRIC ACID, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN COSMETICS AND IN HUMAN AND VETERINARY MEDICINE

Jean Maignan, Tremblay les Gonesse; Gérard Malle, Viliers sur Morin, and Gérard Lang, Saint Gratien, all of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

Filed Apr. 4, 1988, Ser. No. 181,017
Claims priority, application France, Apr. 3, 1987, 87 04711
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—51 **21 Claims**

1. Aromatic derivative of butyric acid having the formula



(I)

wherein

R_1, R_2, R_3 and R_4, each independently, represent hydrogen or lower alkyl, with at least two of R_1–R_4 being other than hydrogen,

A represents methylene or dimethylene, substituted or not by lower alkyl;

R_5 and R_6 represent hydrogen, halogen, lower alkyl, lower alkoxy and hydroxy,

R′ and R″ taken together form oxo,

R_8 represents hydrogen or lower alkyl,

R_7 represents —OR_9 or

R_9 represents hydrogen, alkyl having 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl, aryl or aralkyl, optionally substituted, carboxyalkyl or alkoxycarbonylalkyl,

r′ and r″ represent hydrogen, lower alkyl, monohydroxyalkyl optionally interrupted by a heteroatom, polyhydroxyalkyl, or aryl or benzyl optionally substituted, or

r′ and r″ taken together form a heterocycle optionally substituted by C_1–C_3 hydroxyalkyl, or

the salts of the aromatic derivative of formula I and its optical isomers as well as the tautomer forms of the aromatic derivative of formula I.

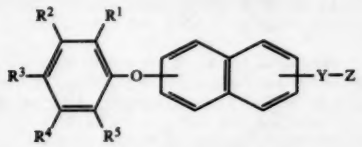
5,068,394

HERBICIDAL (HETERO)ARYLOXYNAPHTHALENE DERIVATIVES AND INTERMEDIATES THEREFOR

Roland Andree, Langenfeld; Michael Haug, Bergisch-Gladbach; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 19, 1989, Ser. No. 424,035
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 3837464
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—56 **14 Claims**

1. An aryloxynaphthalene derivative of the formula



in which

R^1 represents hydrogen, halogen, or trifluoromethyl,

R^2 represents hydrogen or halogen,

R^3 represents halogen, trifluoromethyl or trifluoromethoxy, or

R^4 represents hydrogen or halogen,

R^5 represents hydrogen or halogen,

Y represents in each case optionally branched and/or optionally halogen-substituted alkanediyl or alkenediyl, in each case having at least 2 carbon atoms, and

Z represents —CO—Z^1 group, where

Z^1 represents halogen, hydroxyl, or represents the —O—R^6 group, where

R^5 represents an optionally halogen-substituted radical from the group consisting of alkyl, alkenyl and alkinyl.

5,068,395

PROCESS FOR PRODUCING POLYMERIC PLASTICIZERS FROM POLYETHYLENE TEREPHTHALATE

Oscar M. Bathe, Woodridge, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 25, 1990, Ser. No. 514,429

Int. Cl.[5] C07C *67/10, 69/82*

U.S. Cl. 560—90 **12 Claims**

1. A process for the preparation of plasticizer compositions which comprise the reaction product of recovered polyethylene terephthalate and a trimellitic acid polyester ether to form a copolymer, the said polyester ether being prepared from trimellitic anhydride or trimellitic acid, a polyol of a molecular weight ranging from about 60 to about 650, and a linear alcohol of 8 to 10 carbon atoms, the said copolymer being reacted with a fatty acid of 12 to 18 carbon atoms, which process comprises:

(a) preparing a trimellitic acid polyester ether of at least 500 molecular weight and less than about 2500 molecular weight with at least 3 side chains and at least one hydroxyl group by reacting trimellitic anhydride or trimellitic acid with a polyol of 2 to 16 carbon atoms and molecular weight of from about 60 to about 650 in a mole ratio of about 1:1 to about 1:3, trimellitic anhydride or trimellitic acid to said polyol, and an alcohol of from 8 to 12 carbon atoms in a mole ratio of about 1:1 to about 1:3, trimellitic anhydride or trimellitic acid to said alcohol of 8 to 10 carbon atoms, in the presence of an esterification catalyst at a temperature within the range of from about 380° F. to about 460° F. at a pressure ranging from about 1 to about 30 atmospheres;

(b) reacting in situ said trimellitic acid polyester ether with recovered polyethylene terephthalate at a temperature within the range of from about 380° F. to about 500° F., a pressure from about 1 to about 30 atmospheres, wherein mole ratio of said trimellitic acid polyester ether to said recovered polyethylene terephthalate is in the range of from about 1:1 to about 1:2, to prepare a copolymer of trimellitic acid polyester ether and recovered polyethylene terephthalate of a molecular weight within the range of from about 1000 to about 3000 with at least 3 side chains, and an acid number of from about 5 to about 10; and

(c) reacting said copolymer of said trimellitic acid polyester ether and recovered polyethylene terephthalate with a fatty acid of from about 12 to about 18 carbon atoms in a mole ratio of from about 1:1 to about 1:2, said copolymer to said fatty acid, at a temperature within the range of from about 380° F. to about 500° F. at a pressure ranging from about 1 to about 30 atmospheres.

5,068,396

ARYLCYCLOBUTENE CARBOXYLATE ESTERS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 23, 1989, Ser. No. 370,507

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—102 **8 Claims**

1. A 1-arylcyclobutenecarboxylate ester of a N-glycidyl compound wherein the arylcyclobutene moiety is benzocyclobutene and the N-glycidyl compound has up to 4 rings and up to 30 carbon atoms, inclusive, has from 1 to 4 amino nitrogens and from 2 to 6 glycidyl groups attached to amino nitrogen atoms.

5,068,397

TRIS-PERFLUOROALKYL TERMINATED NEOPENTYL ALCOHOLS AND DERIVATIVES THEREFROM

Robert A. Falk, New City, N.Y.; Kirkland P. Clark, Bethel, Conn.; Michael Jacobson, Haworth, N.J.; Athanasios Karydas, New York, and Juliana Rodgers, Staten Island, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 15, 1990, Ser. No. 567,852

Int. Cl.[5] C07C *309/04*

U.S. Cl. 560—150 **12 Claims**

1. A compound of formula I,

$$(R_f\text{—}E_n\text{—}X\text{—}CH_2)_3CCH_2\text{—}T \qquad (I)$$

where

T is —OH, and

wherein R_f is independently a straight or branched chain perfluoroalkyl of 1 to 12 carbon atoms, perfluoroalkyl of 2 to 6 carbon atoms substituted by perfluoroalkoxy of 2 to 6 carbon atoms, or an oligo(hexafluoropropene oxide) terminal group, and n=1 or 0, and

when n=1,

E is independently a branched or straight chain alkylene of 1 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —NR—, —O—, —S—, SO_2—, —COO—, —OOC—, —CONR—, —NRCO—, —SO_2NR—, and —NRSO_2—, or terminated at the R_f end with —CONR— or —SO_2NR—, where R_f is attached to the carbon or sulfur atom, and X is —S—, or —SO_2—, and

when n=0,

X is a direct bond, —CONR— or —SO_2NR—, where R_f is attached to the carbon or sulfur atom, and where R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 2 to 6 carbon atoms.

5,068,398

PREPARATION OF 6-AMINOCAPROIC ESTERS

Franz Merger, Frankenthal; Rolf Fischer, Heidelberg; Wolfgang Harder, Weinheim; Claus-Ulrich Priester, Ludwigshafen, and Uwe Vagt, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 12, 1989, Ser. No. 448,900

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843792

Int. Cl.[5] C07C *205/02*

U.S. Cl. 560—156 **11 Claims**

1. A process for preparing a 6-aminocaproic ester which comprises:

reacting a C_1–C_4-alkyl 5-formylvalerate with excess ammo-

nia and hydrogen in the presence of a ruthenium catalyst at a temperature of from 80° to 140° C. under superatmospheric pressure in liquid ammonia as the reaction medium.

5,068,399

PROCESS FOR PREPARING UNSATURATED CARBOXYLIC ACID ESTER

Susumu Naito; Takao Kouzai, and Ritoko Ikeda, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 17, 1990, Ser. No. 583,802

Claims priority, application Japan, Nov. 28, 1989, 1-306647

Int. Cl.[5] C07C *67/317*

U.S. Cl. 560—212 **26 Claims**

1. A process for preparing α, β-unsaturated carboxylic acid ester which comprises catalytically reacting at least one acid ester compound selected from the group consisting of an α-hydroxycarboxylic acid ester selected from the group consisting of methyl α-hydroxyisobutyrate and methyl lactate, an α-alkoxycarboxylic acid ester selected from the group consisting of methyl α-methoxyisobutyrate and methyl α-methoxypropionate and aβ-alkoxycarboxylic acid ester selected from the group consisting of methyl β-methoxyisobutyrate and methyl β-methoxypropionate, in a vapor phase in the presence of a catalyst consisting essentially of crystalline aluminosilicate modified with an alkali metal and a platinum group element.

5,068,400

FLUORINE-CONTAINING MONO- OR POLY-ALKYLENE GLYCOL AND METHOD FOR PRODUCING SAME

Masahide Tanaka, Iwakuni; Tokinori Agou, Saeki; Masahiro Kuwahara, Kuga; Takeshi Sakashita, Iwakuni; Tomoaki Shimoda, Kuga, and Masaru Sudou, Otake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

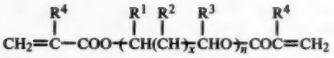
Filed Jun. 29, 1988, Ser. No. 214,188

Claims priority, application Japan, Jun. 29, 1987, 62-161495; Jul. 15, 1987, 62-177419

Int. Cl.[5] C07C *69/52*

U.S. Cl. 560—223 **1 Claim**

1. A mono- or poly-oxyalkylene glycol acrylate of the formula (V)



(V)

wherein

R^4 represents hydrogen or methyl;

R^1, R^2 and R^3 independently represent hydrogen or an alkyl group having 1 to 30 carbon atoms;

x represents an integer of 0 to 100; and

n represents an integer of 1 to 1000;

the mono- or poly-oxyalkylene group in the main chain of said mono- or poly-alkylene glycol having at least one fluorine-substituted hydrocarbon group with 2 to 30 carbon atoms having at least 3 fluorine atoms bonded thereto graft-bonded onto the mono- or poly-oxyalkylene group in the main chain of the mono- or poly-oxyalkylene group in the main chain of the mono- or poly-alkylene glycol per one molecule of the mono- or poly-alkylene glycol.

5,068,401

METHOD FOR PREPARING ORGANIC ESTERS FROM HALOCARBONS AND ALKALI METAL CARBOXYLATES

Garnet E. McConchie; Frank E. Mark, both of Stade, and Hans-Günter Hollmann, Dollern, all of Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1986, Ser. No. 943,977

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545583

Int. Cl.[5] C07C *67/035*

U.S. Cl. 560—236 **1 Claim**

1. A method for preparing an organic ester from its corresponding halocarbon which method comprises contacting an aliphatic halocarbon selected from the group consisting of 1,2-dichloropropane or 1,2,3-trichloropropane with a sodium salt of acetic or propionic acid within a single phase reaction medium containing acetic acid or propionic acid in proportions and at a temperature in the range from about 160° C. to about 300° C. under conditions sufficient to form the organic ester and an inorganic salt which is insoluble within the acetic acid or propionic acid.

5,068,402

STABILIZED POLYISOCYANATES

Josef Pedain, Cologne; Lothar Kahl, Bergisch Gladbach, and Karl-Arnold Weber, Betzweiler, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

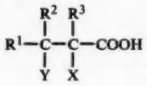
Continuation-in-part of Ser. No. 348,979, May 9, 1989, abandoned. This application Jul. 20, 1990, Ser. No. 555,872

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816118

Int. Cl.[5] C07C *249/00*; C07D *251/00*

U.S. Cl. 560—331 **6 Claims**

1. A modified polyisocyanate which is free from carbodiimide or acylated urea groups and contains free isocyanate groups and a member selected from the group consisting of urethane groups, allophanate groups, urea groups biuret groups, isocyanurate groups, uretdione groups and mixtures thereof and a stabilizing amount of a carboxylic acid corresponding to the formula



wherein

R^1, R^2 and R^3 represent hydrogen or C_1–C_5-alkyl and

X and Y represent hydrogen, chlorine or methyl, with the proviso that when Y=H or CH_3, X=Cl, and when X=H or CH_3, Y=Cl.

5,068,403

INTERMEDIATES USEFUL IN THE PRODUCTION OF PESTICIDES

Michael Elliott, Berkeley, Calif.; Norman F. Janes, Luton, and Bhupinder P. S. Khambay, Harrow Weald, both of England, assignors to National Research Development Corporation, England

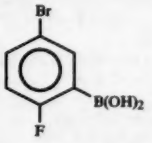
Continuation of Ser. No. 25,230, Mar. 12, 1987. This application Oct. 27, 1989, Ser. No. 428,193

Claims priority, application United Kingdom, Mar. 13, 1986, 8606292; Apr. 18, 1986, 8609590

Int. Cl.[5] C07F *5/02*

U.S. Cl. 562—7 **1 Claim**

1. A compound of the formula



(III)

5,068,404

THERMAL DEALKYLATION OF N-ALKYL N-PHOSPHONOMETHYLGLYCINE

William H. Miller, Glendale, and Terry M. Balthazor, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 329,053, Mar. 27, 1989, abandoned, which is a continuation of Ser. No. 874,752, Jun. 16, 1986, abandoned, which is a continuation of Ser. No. 687,404, Dec. 28, 1984, abandoned. This application Mar. 26, 1990, Ser. No. 501,390

Int. Cl.[5] C07F *9/38*

U.S. Cl. 502—17 9 Claims

1. A process for producing the alkali metal salts of N-phosphonomethylglycine in high yields in the absence of a catalyst, which comprises heating to above about 200° C., a basic aqueous solution of a di- or tri-alkali metal salt of N-alkyl-N-phosphonomethylglycine, wherein the N-alkyl group is selected from the group consisting of ethyl, isopropyl and secondary-butyl.

5,068,405

FAMOTIDINE INTERMEDIATES AND THEIR PREPARATION

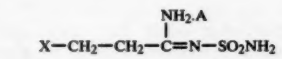
Michel Bekhazi, and Josef Oren, both of Quebec, Canada, assignors to Delmar Chemicals Inc., Quebec, Canada

Filed Jul. 6, 1990, Ser. No. 549,222

Int. Cl.[5] C07C *307/00, 53/10, 309/04, 309/30*

U.S. Cl. 562—83 7 Claims

1. Halogenated N-sulfamyl propionamidine addition salts of the formula:



in which X represents halogen and A represents an acid selected from sufuric acid; nitric acid; benzenesulfonic acid; toluenesulfonic acid; 2,4,5-trichlorobenzenesulfonic acid; trichloroacetic acid; trifluoroacetic acid; and methanesulfonic acid.

5,068,406

COMPARTMENTED OXIDATION METHOD

Juergen K. Holzhauer, Naperville; Albert P. Brown, Downers Grove, and Aubrey C. Reeve, Warrenville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 403,769, Sep. 6, 1989. This application Aug. 1, 1990, Ser. No. 561,063

Int. Cl.[5] C07C *51/265*

U.S. Cl. 562—413 16 Claims

1. A method for continuously oxidizing an alkylaromatic in the liquid phase and under oxidation-reaction conditions to produce an aromatic carboxylic acid, comprising the steps of:

sequentially passing at least a portion of a reaction mixture including the alkylaromatic through a plurality of series-arranged walled but communicating compartments of a reactor means maintained under predetermined oxidation-reaction conditions, from an initial one of the series-arranged walled plural compartments downstream to a terminal one thereof, introducing the remainder portion of the reaction mixture into another one of the series-arranged walled plural compartments downstream from the initial compartment, and passing said remainder portion to the terminal compartment while agitating the contents of each of the walled plural compartments and producing in each of the walled plural compartments an aromatic carboxylic acid-containing liquid phase and a gaseous phase; at least a portion of the walls of said series-arranged compartments being apertured to enable passage of the reaction mixture through the reactor means from the initial one of the series-arranged plural compartments to the terminal one thereof;

withdrawing from the terminal compartment a portion of the gaseous phase contained therein;

condensing at least a portion of the thus-withdrawn gaseous phase to produce a liquid stream; and

returning at least a portion of the thus-condensed liquid stream to preselected ones of the walled plural compartments to maintain a preselected liquid-phase temperature differential between the terminal and initial compartments of the reactor.

5,068,407

OXIDATION OF TERTIARY-ALKYL SUBSTITUTED AROMATICS

Roy A. Periana, San Jose, Calif., and George F. Schaefer, Olivette, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 31, 1990, Ser. No. 473,031

Int. Cl.[5] C07C *41/265*

U.S. Cl. 562—416 9 Claims

1. A process for the production of an aromatic acid or acids from tertiary-alkyl substituted aromatic compounds, said process comprising oxidizing with oxygen a tertiary-alkyl group of a tertiary-alkyl substituted aromatic compound in a solvent in the presence of a catalytic amount of a catalyst composition comprising a cobalt salt, a manganese salt, and a halide selected from the group consisting of chlorides and fluorides, said manganese salt being present in a molar ratio of manganese to cobalt of from about 0.001:1 to about 0.5:1 and said halide being present in a molar ratio of halide to cobalt of from about 1:1 to about 2:1, said solvent comprising an organic aliphatic carboxylic acid having from 2 to about 5 carbon atoms.

5,068,408

HYPOCHLOROUS ACID AS A REAGENT FOR THE OXIDATION OF ORGANIC COMPOUNDS IN TWO PHASE SYSTEMS

Robert J. Raynor, North Branford, Conn., and Budd L. Duncan, Athens, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jan. 31, 1990, Ser. No. 473,084

Int. Cl.[5] C07C *51/29, 29/48, 37/60, 45/27, 253/00*

U.S. Cl. 562—419 21 Claims

1. A process for oxidizing an organic compound selected from an aliphatic, aromatic, aliphatic/aromatic, cycloaliphatic, and heterocyclic alcohol, thiol, sulfide, aldehyde, amine, amide, ketone, acid, ether, ester, and organic compounds containing an activated carbon-carbon. double bond, which process comprises contacting said organic compound dissolved in an inert organic solvent with a hypochlorous acid solution.

5,068,409

BIS(4-HALO-PHTHALIC ACID) QUARTER SALT, PROCESS FOR THEIR PREPARATION AND THEIR USE

Olga Vainberg, and Leonard M. Shorr, both of Haifa, Israel, assignors to Bromine Compounds Ltd., Beer Sheva, Israel

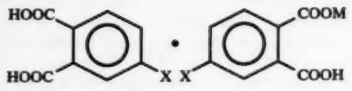
Filed Sep. 7, 1990, Ser. No. 579,360

Claims priority, application Israel, Sep. 8, 1989, 91563

Int. Cl.[5] C07C *63/20, 51/41, 51/487*

U.S. Cl. 562—480 8 Claims

1. The bis(4-halo-phthalic acid) quarter salt of the formula



(I)

wherein M is an alkali metal or ammonium ion, and X is a halogen atom.

5,068,410

PROCESS FOR PRODUCING HIGHLY PURE 2,6-NAPHTHALENE DICARBOXYLIC ACID

Toru Tanaka, and Masato Inari, both of Okayama, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 613,005
Claims priority, application Japan, Nov. 15, 1989, 1-294909
Int. Cl.[5] C07C *57/06*
U.S. Cl. 562—483 **5 Claims**

1. A process for producing highly pure 2,6-naphthalene dicarboxylic acid, characterized by hydrolyzing 2,6-dimethyl naphthalene dicarboxylate more than 99% pure in an aqueous solution by using an aromatic poly-carboxylic acid or an anhydride thereof as a catalyst.

5,068,411

TRIFLUOROBENZENE COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Hiroshi Kobayashi, Fukuoka, and Masaaki Shimizu, Kanagawa, both of Japan, assignors to SDS Biotech K.K., Tokyo, Japan

Division of Ser. No. 327,495, Mar. 24, 1989, abandoned, which is a division of Ser. No. 243,753, Sep. 14, 1988, Pat. No. 4,925,966. This application Feb. 7, 1990, Ser. No. 476,214
Claims priority, application Japan, Sep. 14, 1987, 62-228286
Int. Cl.[5] C07C *51/08*
U.S. Cl. 562—484 **1 Claim**

1. A process for producing 2,4,5-trifluoroisophthalic acid which comprises hydrolyzing 2,4,5-trifluoroisophthalonitrile under conditions rendered acidic by using sulfuric acid in an amount of 3 to 20 parts by weight per part by weight of 2,4,5-trifluoroisophthalonitrile and at a concentration of 50 to 70 wt %.

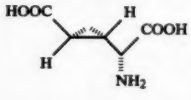
5,068,412

(2R,3S,4S)-α-(CARBOXYCYCLOPROPYL)GLYCINE

Yasufumi Ohfune; Keiko Shimamoto, both of Osaka; Haruhiko Shinozaki, and Michiko Ishida, both of Saitama, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Oct. 17, 1989, Ser. No. 422,796
Claims priority, application Japan, Oct. 17, 1988, 63-261155
Int. Cl.[5] C07C *101/20*
U.S. Cl. 562—506 **1 Claim**

1. (2R,3S,4S)-α-(carboxycyclopropyl)glycine of the formula (1) or salts thereof selected from the group consisting of ammonium, sodium, potassium and calcium salts.



(1)

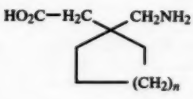
5,068,413

PROCESS FOR THE PREPARATION OF CYCLIC AMINO ACIDS AND INTERMEDIATES USEFUL IN THE PROCESS

Klaus Steiner, Tannenweg; Wolfgang Herrmann, Zum Baumgarten; Günter Crone, Freiburg, all of Fed. Rep. of Germany, and Charles S. Combs, Chester, N.J., assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Aug. 21, 1990, Ser. No. 570,493
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928184
Int. Cl.[5] C07C *229/28*
U.S. Cl. 562—507 **15 Claims**

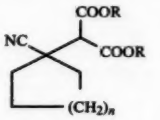
1. A process for the preparation of a compound formula



(I)

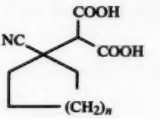
or a pharmaceutically acceptable salt thereof, wherein n is an integer of from 1 to 3 comprising:

(a) converting a malonic ester of formula



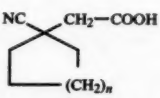
(II)

wherein R is an alkyl of from 1 to 5 carbon atoms and n is as described above by alkaline hydrolysis into a cyanocycloalkylmalonic acid derivative of formula



(II)

(b) diacarboxylating gently the cyanocycloalkylmalonic acid of step (a) to produce a 1-cyanocycloalkylacetic acid of formula



(IV)

(c) hydrogenating the acetic acid from step (b) in an alkanol solvent using a catalyst to produce a compound of formula I above.

9. A process according to claim 1, wherein the product formed is gabapentin.

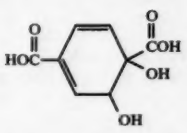
5,068,414

HYDROXYTEREPHTHALIC ACID

Mark E. Ruppen, Martinsville, and Scott Hagedorn, West Trenton, both of N.J., assignors to Celgene Corporation, Warren, N.J.

Filed Jan. 26, 1990, Ser. No. 470,685
Int. Cl.[5] C07C *62/00*
U.S. Cl. 562—508 **2 Claims**

1. A compound selected from the group consisting of 1,2-dihydroxycyclohexa-3,5-diene-1,4-dicarboxylic acid of the formula:



and the salts thereof with non-toxic metals, ammonium, and mono-, di- and trisubstituted amines.

5,068,415

PROCESS FOR THE PREPARATION OF HALOGENOTETRAFLUOROPROPIONIC ACID

Konrad von Werner, Halsbach, and Anton Probst, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 939,544, Dec. 9, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 93,309

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543710

Int. Cl.[5] C07C *51/285, 53/21*

U.S. Cl. 562—541 1 Claim

1. A process for the preparation of 3-iodotetrafluoropropionic acid, which comprises:

reacting iodine, tetrafluoroethylene and ethylene in a molar ratio of 1:(1.2–2):(1–1.2) at a temperature of 170° to 200° C. in a one-pot reaction, and isolating from the resulting reaction product the compound 1,4-diiodo-1,1,2,2-tetrafluorobutane,

the 1,4-diiodo-1,1,2,2-tetrafluorobutane reacting with at least a stoichiometric amount of potassium hydroxide or sodium hydroxide in the form of an approximately 10 to 60% strength by weight aqueous solution at a temperature of 20° to 100° C. and in the presence of a phase transfer catalyst in an amount of 0.1 to 5 mol %, relative to the amount of 1,4-diiodo-1,1,2,2-tetrafluorobutane, to eliminate hydrogen iodide, and isolating 1-iodo-1,1,2,2-tetrafluoro-3-butene from this reaction product,

oxidizing the 1-iodo-1,1,2,2,-tetrafluoro-3-butene with at least a stoichiometric amount of potassium permanganate in the form of an approximately 10 to 40% strength by weight aqueous solution or suspension at a temperature of 5° to 50° C. and in the presence of a phase transfer catalyst in an amount of 0.5 to 5 mol %, relative to the amount of 1-iodo-1,1,2,2,-tetrafluoro-3-butene in order to convert the 1-iodo-1,1,2,2,-tetrafluoro-3-butene to the corresponding propionic acid, and

isolating 3-iodo,2,2,3,3-tetrafluoropropionic acid from the reaction product.

5,068,416

PREPARATION OF β-ALANINEDIACETIC ACID OR ITS ALKALI METAL OR AMMONIUM SALTS

Richard Baur, Mutterstadt; Charalampos Gousetis, Ludwigshafen; Wolfgang Trieselt, Ludwigshafen; Werner Bochnitschek, Ludwigshafen, and Alfred Oftring, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 394,816

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829859

Int. Cl.[5] C07C *229/00*

U.S. Cl. 562—571 3 Claims

1. A process for the preparation of β-alaninediacetic acid comprising:

reacting iminodiacetic acid and acrylic acid in a nonbasic aqueous medium to form said β-alaninediacetic acid.

5,068,417

PROCESS FOR THE CONTINUOUS PREPARATION OF GLYOXYLIC ACID

Alexander Sajtos, Linz; Engelbert Kloimstein, Eferding; Karl Höllinger, and Lorenz Farnlettner, both of Linz, all of Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria

Filed May 25, 1990, Ser. No. 530,966

Claims priority, application Austria, Jun. 5, 1989, 1357/89

Int. Cl.[5] C07C *59/147*

U.S. Cl. 562—577 9 Claims

1. Process for the continuous preparation of a pure concentrated aqueous solution of glyoxylic acid having a low color number by hydrolysis of glyoxylic acid ester hemiacetals, comprising treating the glyoxylic acid ester hemiacetals with steam in countercurrent in a reactor cascade.

5,068,418

SEPARATION OF LACTIC ACID FROM FERMENTATION BROTH WITH AN ANIONIC POLYMERIC ABSORBENT

Santi Kulprathipanja, Inverness, and Anil R. Oroskar, Downers Grove, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 8, 1989, Ser. No. 349,272

Int. Cl.[5] C07C *51/42*

U.S. Cl. 562—580 13 Claims

1. A process for separating lactic acid from a fermentation broth mixture containing lactic acid produced by a fermentation process comprising contacting said feed mixture with an anionic polymeric adsorbent comprising a weakly basic anionic exchange resin possessing pyridine functional groups at adsorption conditions selected to selectively adsorb said lactic acid and thereafter recovering said lactic acid from said adsorbent with a desorbent consisting essentially of water or a dilute inorganic acid at desorption conditions, said adsorption conditions including a pH below the ionization constant (pKa) of lactic acid.

7. A process for separating lactic acid from a fermentation broth mixture containing lactic acid produced by a fermentation process comprising contacting said feed mixture with an anionic polymeric adsorbent selected from the group consisting of a weakly basic anionic exchange resin processing tertiary amine functional groups and a strongly basic anionic exchange resin possessing quaternary amine functional groups and mixtures thereof at adsorption conditions selected to selectively adsorb said lactic acid and thereafter recovering said lactic acid from said adsorbent with a desorbent comprising water or a dilute inorganic acid at desorption conditions, said adsorption conditions including a pH below the ionization constant (pKa) of lactic acid.

5,068,419

SEPARATION OF AN ORGANIC ACID FROM A FERMENTATION BROTH WITH AN ANIONIC POLYMERIC ADSORBENT

Santi Kulprathipanja, Inverness, and Anil R. Oroskar, Downers Grove, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 121,830, Nov. 16, 1987, Pat. No. 4,851,573, and a continuation-in-part of Ser. No. 122,161, Nov. 16, 1987, Pat. No. 4,851,574, each is a continuation-in-part of Ser. No. 943,219, Dec. 18, 1986, Pat. No. 4,720,579. This application May 8, 1989, Ser. No. 349,273

Int. Cl.[5] C07C *51/42*

U.S. Cl. 562—580 13 Claims

1. A process for separating a mono-, di- or polycarboxylic acid from a fermentation broth feed mixture containing said carboxylic acid produced by a fermentation process comprising contacting said feed mixture with an anionic polymeric adsorbent selected from the group consisting of a weakly basic anionic exchange resin possessing tertiary amine or pyridine functional groups and a strongly basic anionic exchange resin possessing quaternary amine functional groups and mixtures

thereof at adsorption conditions selected to selectively adsorb said carboxylic acid and thereafter recovering said carboxylic acid from said adsorbent with a desorbent at desorption conditions, said adsorption conditions being characterized as a pH below the first ionization constant (pKa_1) of said carboxylic acid.

5,068,420

PROCESS FOR PREPARING ETHER CARBOXYLATE BUILDERS

Martin A. Kreczmer, St. Peters, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 458,008, Dec. 28, 1989. This application Nov. 9, 1990, Ser. No. 608,613

Int. Cl.[5] C07C *59/245*

U.S. Cl. 562—583 15 Claims

1. In a process for the purification of ether carboxylate salts produced by the calcium catalyzed reaction, in alkaline reaction medium, of salts of maleic acid and a hydroxy acid, the improvement which comprises:

a. adjusting the pH of the mixture to a range of from about 9 to about 10.5;

b. providing a water concentration in the mixture of from about 20% to about 35% by weight of the mixture;

c. extracting impurities from the mixture by intimately contacting the mixture with a lower alkyl alcohol in a single stage, whereby the water content during extraction is in the range of from about 20% to about 35%, by weight; and

d. separating the alcohol from the mixture.

5,068,421

CHEMICAL PROCESS

Liou-Liang Horng, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 235,854, Aug. 24, 1988, Pat. No. 4,959,496. This application Sep. 20, 1990, Ser. No. 585,541

Int. Cl.[5] C07C *59/125*

U.S. Cl. 562—583 14 Claims

1. An improved process for preparing the alkali metal salts of oxydisuccinic acid which comprises reacting in an alkaline reaction medium the salts of maleic acid and malic acid in the presence of calcium ion catalyst, reducing the pH of the reaction product to a range of from about 7 to about 8.5 whereby unreacted starting acids salts are precipitated and removed from the reaction product and then lowering the pH of the reaction product to a range of from about 4 to about 6 whereby additional starting acid salts precipitate and are removed from the reaction product.

5,068,422

CARBOXY ETHERS

Dieter Balzer, Haltern; Heinz Reimer, Bottrop, and Werner Friedrich, Herten, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 13, 1989, Ser. No. 450,090

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3903663

Int. Cl.[5] C07C *59/10*

U.S. Cl. 562—587 10 Claims

1. A carboxy ether of formula (II):

ti $[R—O(C_3H_6O)_x(C_2H_4O)_y(C_3H_6O)_z]_2CHCOOM$ (II)

wherein:

R is (i) a saturated or unsaturated, linear or branched C_{6-20} -alkyl group; (ii) a phenyl group substituted with a C_{4-16}-alkyl group or a cycloaliphatic group substituted with a C_{4-16}-alkyl group; (iii) a dialkylphenyl group, wherein the total number of carbon atoms int he alkyl groups is 5 to 24, a dialkylcycloaliphatic group, wherein the total number of carbon atoms in the alkyl groups is 5 to 24, or a trialkylcycloaliphatic group, wherein the total number of carbon atoms in the alkyl groups is 5 to 24; or (iv) a trialkylphenyl group, wherein the total number of carbon atoms in the alkyl groups is 7 to 28;

x is 0 to 15, y is 1 to 40, z is 0 to 15; and

M is an alkali metal cation, an alkaline earth metal cation, an ammonium cation, a C_{1-4}-alkylammonium cation, or a proton.

5,068,423

TRISUBSTITUTED BENZOIC ACID INTERMEDIATES

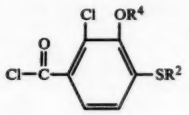
William J. Michaely, El Cerrito, and Jeff K. Curtis, Berkeley, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 386,648, Jul. 31, 1989, Pat. No. 5,001,256, which is a division of Ser. No. 273,391, Nov. 18, 1988, abandoned. This application Dec. 10, 1990, Ser. No. 624,934

Int. Cl.[5] C07C *63/10*

U.S. Cl. 562—840 2 Claims

1. The compound of the structural formula



wherein R^4 is $—CH_2CH_2OCH_3$, $—CH_2CH_2OC_2H_5$, $—CH_2CH_2SCH_3$ or $—CH_2CH_2SC_2H_5$ and R^2 is C_1–C_4 alkyl.

5,068,424

PROCESS FOR PREPARING ARYLSULPHONYL-ISOCYANATES AND ADDITION DERIVATIVES THEREOF

Gábor Besenyei; Sándor Németh; László Simándi; Mária Belák, all of Budapest; József Dukai, Veszprém; Lajos Nagy, Füfö gyártelep; Elemér Tömördi, Veszprém; Csaba Söptei, Veszprém, and Erzsébet E. Diószeginé, Veszprém, all of Hungary, assignors to Nitrokémia Ipartelepek and Magyar Tudományos Akadémia Központi Kémiai Kutató Intézete, both of Budapest, Hungary

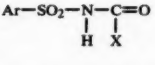
Filed Jun. 14, 1989, Ser. No. 365,790

Claims priority, application Hungary, Jun. 17, 1988, 3115/88; Jul. 22, 1988, 3887/88; Jul. 22, 1988, 3888/88

Int. Cl.[5] C07C *263/00*

U.S. Cl. 562—870 8 Claims

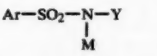
1. A process for preparing an arylsulfonyl isocyanate of formula I



(I)

and addition derivatives thereof, wherein Ar is an unsubstituted or a C_{1-4} alkyl substituted phenyl, and H and X together are a chemical bond, which comprises

(a) carbonylating an N-haloarylsulfonamide of formula II



(II)

wherein

Ar is as defined above, Y is a chlorine or bromine atom, M is a sodium, potassium, quaternary ammonium, or a quaternary phosphonium ion, in the presence of a carbonylating catalyst, carbon monoxide, and from 0% to a catalytically effective amount of a phase transfer catalyst.

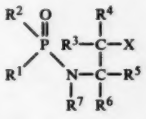
5,068,425

PROCESS OF PREPARATION OF PHOSPHINAMIDES, APPLICATIONS AND NEW PRODUCTS

Sylvain Juge, Puteaux, France, assignor to Societe Nationale Elf Aquitaine, France

Division of Ser. No. 754,956, Jul. 15, 1985, Pat. No. 4,983,768, Continuation-in-part of Ser. No. 448,370, Dec. 9, 1982, abandoned. This application Oct. 17, 1990, Ser. No. 598,927
Claims priority, application France, Dec. 11, 1981, 8123153; Dec. 3, 1982, 8220264
Int. Cl.[5] C07F *9/36*
U.S. Cl. 564—12 11 Claims

1. A phosphinamide of the structure:



where X is halogen; R^1, R^2 and R^4 are individually selected from C_1 to C_4 alkyl, phenyl, substituted phenyl and benzyl; R^3 and R^5 are hydrogen; and R^6 and R^7 are individually C_1 to C_4 alkyl.

5,068,426

PURIFICATION OF N,N-DIALKYLCARBAMOYLMETHYLPHOSPHINE OXIDE

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Akzo NV, Arnhem, Netherlands

Continuation-in-part of Ser. No. 370,227, Jun. 22, 1989, abandoned. This application Jan. 19, 1990, Ser. No. 467,712
Int. Cl.[5] C07F *9/28*
U.S. Cl. 564—15 16 Claims

1. A process for the purification of an N,N-dialkylcarbamoylmethylphosphine oxide compound (CMPO) dissolved in organic solvent which comprises treatment with a first row transition metal salt to form an insoluble complex therefrom which is then reacted with aqueous base to regenerate purified CMPO.

5,068,427

PROCESS FOR THE PREPARATION OF ALKANE- AND ARENESULFONAMIDES

Stanley R. Sandler, Springfield; Steven G. Schon, Strafford, and David M. Gardner, King of Prussia, all of Pa., assignors to Atochem North America, Inc., Philadelphia, Pa.

Filed Nov. 16, 1989, Ser. No. 438,389
Int. Cl.[5] C07C *303/38*
U.S. Cl. 564—84 10 Claims

1. A process for the preparation of alkane- and arenesulfonamides having the formula RSO_2NH_2, wherein R is selected from C_1 to C_{20} alkyl, C_6 to C_{20} aryl, substituted C_1 to C_{20} alkyl, and substituted C_6 to C_{20} aryl, wherein the substituent groups are inert to the reaction,

which proces comprises treating with ammonia, in the absence of an additional solvent, an alkane- or arenesulfonyl halide having the formula:

RSO_2X

wherein R is as defined above and X is fluorine, chlorine, bromine or iodine, the reaction being carried out at a selected pressure which controls the reaction at a preselected temperature in the range of from about −20° C. to about 132° C., said ammonia being brought to boil by the heat of reaction generated by its reaction with RSO_2X, and said heat of reaction being removed by condensing the boiled-up ammonia vapors and returning the condensate to the reaction liquid.

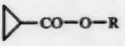
5,068,428

PROCESS FOR THE PREPARATION OF CYCLOPROPANECARBOXAMIDE

Herbert Diehl, Leverkusen; Heinz U. Blank, Odenthal-Globebusch, and Edwin Ritzer, Gladbeck, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 423,068, Oct. 18, 1989, abandoned. This application Sep. 26, 1990, Ser. No. 588,251
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1988, 3836782
Int. Cl.[5] C07C *231/00*
U.S. Cl. 564—134 6 Claims

1. A process for the preparation of cyclopropanecarboxamide comprising reacting a cyclopropanecarboxylic acid ester of the formula



in which

R is C_4-alkyl,

with ammonia in the presence of an alkali metal alcoholate of a monohydric C_4-alcohol in the absence of a hydrocarbon solvent at 60°-200° C., wherein (a) 2-20 mol % of alcoholate, relative to the number of moles of the ester to be reacted, are used, (b) the alcoholate is in the form of a 25-50% by weight alcoholic solution, and (c) alcohol is either not added at the beginning of the reaction or the amount of alcohol present at the beginning of the reaction is only such as is necessary for the handling of the alcoholate.

5,068,429

METHOD OF PURIFICATION OF THE OXALIC ACID DIAMIDE

Loreno Lorenzoni, Porto Torres; Nino Dessantis, Sassari, and Angelo Virdis, Usini, all of Italy, assignors to Enichem Anic S.p.A., Palermo, Italy

Continuation of Ser. No. 32,552, Apr. 1, 1987, abandoned. This application Oct. 24, 1989, Ser. No. 426,531
Claims priority, application Italy, Apr. 17, 1986, 20122 A86
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] C07B *63/00;* C07C *103/14*
U.S. Cl. 564—160 11 Claims

1. A process for removing copper from a copper-containing oxamide, which comprises:

a) contacting the oxamide with an effective amount of an aqueous solution of a complexing agent which is capable of forming copper-containing water-soluble complexes and which imparts to the aqueous solution a pH in the range of 2 to 8, and

b) removing purified oxamide from the solution of the copper-containing complex, and wherein the complexing agent comprises a secondary or tertiary nitrogen-containing organic compound having two or more carboxy groups, which are either free or partially salified.

5,068,430

BLEACHING OF COLORED AMINE OXIDES

James E. Borland; Y.-D. Mark Chen; Joe D. Sauer; Kim R. Smith, and Rebecca F. Smith, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 26, 1990, Ser. No. 558,094
Int. Cl.[5] C07C *291/00*
U.S. Cl. 564—298 9 Claims

1. A process which comprises exposing a carbon dioxide-discolored amine oxide to visible light until the amine oxide is bleached.

5,068,431

METHODS OF MAKING NEW SURFACE ACTIVE COMPOUNDS

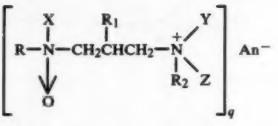
Anastasios Karalis, Downers Grove; Thomas Morong, Justice, and Charles Juszkiewicz, Woodridge, all of Ill., assignors to Witco Corporation, New York, N.Y.

Division of Ser. No. 91,058, Aug. 31, 1987, Pat. No. 4,864,060. This application May 15, 1989, Ser. No. 351,887

Int. Cl.[5] C07C *213/00*

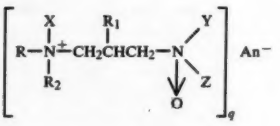
U.S. Cl. 564—301 **11 Claims**

1. A method of preparing a compound selected from those of the following formulae:



I.

and



II.

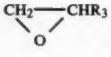
and mixtures of I and II, wherein

1) R is a C_6 to C_{30} aliphatic radical, preferably alkyl or alkenyl;
2) X, Y and Z are independently selected from the group consisting of C_1 to C_6 alkyl, C_2 to C_6 alkenyl and $(—CH_2CHR_3O—)_nH$ groups wherein R_3 is independently selected from hydrogen and C_1 to C_4 alkyl, and n is independently an integer from 1 to 20;
3) R_2 is C_1 to C_{18} alkyl, C_2 to C_{18} alkenyl, benzyl or phenylethyl;
4) R_1 is hydrogen, C_1 to C_4 alkyl or C_2 to C_6 alkenyl;
5) An is a water-solubilizing anion;
6) q is an integer of 1 to 4 equivalent to the valence of the anion (An); and at least one of X, Y and Z is a $(—CH_2CHR_3O—)_nH$ group comprising:

A. reacting a compound of the formula

$$RNHCH_2CHR_1CH_2NH_2$$

with at least 3 moles per mole of said latter compound of an alkylating agent which comprises at least one mole per mole of said compound of an alkylene oxide of the formula



and then reacting the resulting di-tertiary amine, in either order with

B. one mole per mole of said amine of an alkylating agent of the formula R_2 An to quaternize one tertiary atom and with

C. an oxidizing agent to oxidize the other tertiary nitrogen atom to an amine oxide.

5,068,432

PROCESS FOR PRODUCING OPTICALLY PURE 2-PHENOXYPHENYLALKYLAMINES

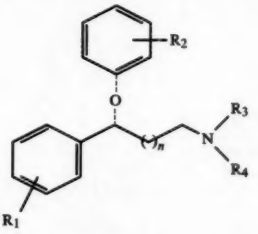
Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Continuation of Ser. No. 364,831, Jun. 12, 1989, abandoned, which is a division of Ser. No. 175,178, Mar. 30, 1988, Pat. No. 4,868,344. This application Feb. 1, 1991, Ser. No. 649,160

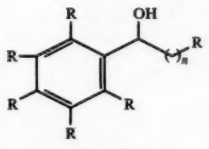
Int. Cl.[5] C07C *209/08*

U.S. Cl. 564—347 **8 Claims**

1. A process for producing a substituted phenoxyphenylalkylamine represented by the formula:



wherein R_1 is hydrogen, loweralkyl, lower alkoxy or halolower alkyl, R_2 is selected from hydrogen, lower alkyl, lower alkoxy or haloloweralkyl, n is an integer from 0–10, and R_3 and R_4 each are the same or different members of the group consisting of hydrogen or lower alkyl: comprising the steps of reducing a halosubstituted phenyl- or substituted phenylalkylketone with an optically pure (+)- or (−)-diisopinocampheylhaloborane to obtain a haloalcohol represented by the formula:



wherein each R is the same or different member of the group consisting of fluoro, chloro, bromo and iodo with the limitation that at least one R must be other than hydrogen, and n is an integer of 0–10, treating said haloalcohol with an amine of the fomrula NR_3R_4 and isolating the resulting maine.

5,068,433

PROCESS FOR PREPARATION OF 3-SUBSTITUTED DERIVATIVES OF 1-AMINO-2-HYDROXY PROPANE

Piero Melloni, Bresso; Arturo D. Torre, Gallarate; Ettore Lazzari, and Giuseppe Mazzini, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.r.l., Milan, Italy

Continuation of Ser. No. 349,965, May 8, 1989, abandoned, which is a continuation of Ser. No. 227,414, Jul. 29, 1988, abandoned, which is a continuation of Ser. No. 16,505, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 751,858, Jul. 5, 1985, abandoned. This application Jun. 11, 1990, Ser. No. 536,039

Claims priority, application United Kingdom, Aug. 2, 1984, 8419683

Int. Cl.[5] C07G *217/44, 217/64*

U.S. Cl. 564—349 **1 Claim**

1. (RS,RS)- or (RS,SR)-1-amino-2-hydroxy-3-(2-ethoxyphenoxy)-3-phenyl-propane.

5,068,434

PROCESS FOR THE PREPARATION OF N-ALKYLATED ANILINES

Günter Klug, Monheim; Hans-Josef Buysch, Krefeld, and Lothar Puppe, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

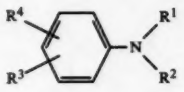
Filed Jan. 25, 1989, Ser. No. 301,929

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803661

Int. Cl.[5] C07C *209/18*

U.S. Cl. 564—399 12 Claims

1. A process for the preparation of an N-alkylated aniline of the formula



comprising reacting an aniline of the formula

in which formulae

R^1 denotes C_1–C_4-alkyl

R^2 denotes hydrogen or C_1–C_4-alkyl, and

R^3 and R^4 independently of one another stand for hydrogen C_1–C_4-alkyl,

C_4-alkyl C_1–C_4-alkoxy, fluorine, chlorine or bromine, with a C_1–C_4-alcohol or the corresponding dialkyl ethers in the presence of a zeolite at elevated temperature, the improvement wherein the zeolite is of the pentasil type and is selected from the group consisting of ZSM 5, ZSM 8, ZSM 11, or ZSM 5/ZSM 11-intermediates containing protons, having 0 to 25 equivalent % of the protons exchanged for sodium, potassium, magnesium, zinc, cobalt, copper, calcium, iron, rare earths, tin, manganese, chromium, titanium, zirconium and/or tantalum, and having an SiO_2/Al_2O_3 of 80 to 1000 and wherein the pentasil zeolite is compacted with a binder and granulated and wherein the reaction is carried out at a temperature from 220° to 370° C.

5,068,435

ORTHO-ALKYLATED AROMATIC AMINES VIA GAMMA ALUMINA CATALYST

William F. Burgoyne, Jr., Emmaus, Pa., and Dale D. Dixon, Venice, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 796,465, Nov. 8, 1985, Pat. No. 4,740,620. This application Mar. 25, 1988, Ser. No. 173,221

Int. Cl.[5] C07C *201/68*

U.S. Cl. 564—409 9 Claims

1. In a process for alkylating aromatic amines by contacting said aromatic amine with an olefin in the presence of a catalyst system, the improvement for producing alkylated aniline and toluidine which comprises:

contacting aniline, toluidine or the N-alkylated derivatives thereof with an olefin selected from the group consisting of ethylene, propylene and isobutylene in the presence of a non-acid-activated gamma alumina wherein the reaction is carried out in a fixed bed catalytic rector and the liquid hourly space velocity is 0.05 to 6 $hrs.^{-1}$.

4. In a process for alkylating ortho alkylaniline by contacting said aniline with an olefin in the presence of a catalyst system, the improvement for obtaining high conversion of alkyl-substituted anilines to alkylanilines having dissimilar alkyl groups, the improvement which comprises effecting said reaction of alkyl substituted alkylaniline with a C_{2-6} olefin in the presence of gamma-alumina.

5,068,436

HYDROGENATION OF HALONITROBENZENES WITHOUT DEHALOGENATION

Donald D. May, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1989, Ser. No. 321,389

Int. Cl.[5] C07C *209/00*

U.S. Cl. 564—417 8 Claims

1. In a process for the catalyzed hydrogenation of fluorinated and chlorinated benzenoid nitro compounds having acidic substituents to produce the corresponding substituted anilines, the improvement comprising introducing an amount of acid equivalent to the catalyst employed on a molar basis into a hydrogenation mass, said acid having a dissociation constant pKa value of 5 or less.

5,068,437

PROCESS FOR PRODUCING 2-(P-CHLOROPHENOXY) ANILINE

John Kazan, and James J. Kelly, both of Somerset County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 24, 1987, Ser. No. 65,744

Int. Cl.[5] C07C *209/36*

U.S. Cl. 564—417 1 Claim

1. A process for producing 2-(p-chlorophenoxy)aniline which comprises the steps of:

a) preparing a solution comprising 0.1 to 3.0 parts platinum catalyst, 2,000 to 2,200 parts of 2-(p-chlorophenoxy)nitrobenzene and 6,000 to 6,500 parts of o-dichlorobenzene;

b) adjusting and maintaining the temperature at 80° C. to 110° C. while adding 700 to 1,000 parts hydrazine hydrate in water with temperature maintainance at 80° C. to 110° C. for 8–24 hours;

c) cooling to 20° C. to 40° C.;

d) adding 0–150 parts filter aid;

e) stirring the mixture for 5 to 30 minutes;

f) filtering the mixture to clarify the mixture;

g) washing the filter cake with 100 to 200 parts of o-dichlorobenzene;

h) combining the filtrate from step f) and the wash from step g);

i) collecting the lower organic layer, distilling at 60° C. to 110° C.; and then

j) cooling the 2-(p-chlorophenoxy)aniline product to 20°–40° C.

5,068,438

PROCESS FOR SURFACE TREATMENT OF N-ALKYL-N'PHENYL-P-PHENYLENEDIAMINE

Katsumi Kobayashi, Yokkaichi, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Continuation of Ser. No. 244,649, Sep. 13, 1988, abandoned, which is a continuation of Ser. No. 796,627, Nov. 8, 1985, abandoned. This application Dec. 7, 1989, Ser. No. 449,103

Int. Cl.[5] C07C *209/82, 211/55*

U.S. Cl. 564—434 10 Claims

1. A process for the surface treatment of N-alkyl-N'-phenyl-p-phenylenediamine particles, which comprises charging granulated N-alkyl-N'-phenyl-p-phenylenediamine particles in a rotatable vessel, and rotating the vessel at a temperature lower than the melting point of the N-alkyl-N'-phenyl-p-phenylenediamine to cause the N-alkyl-N'-phenyl-p-phenylenediamine particles to freely flow.

5,068,439

N-SUBSTITUTED PHENYLENEDIAMINE COMPOUNDS

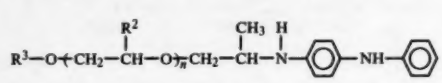
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 490,211, Mar. 8, 1990, Pat. No. 4,968,843. This application Oct. 12, 1990, Ser. No. 596,455

Int. Cl.[5] C07C *211/27*

U.S. Cl. 564—434 2 Claims

1. An N-substituted phenylenediamine of the formula:



wherein R^2 may be the same or different and is selected from the group of radicals consisting of hydrogen and an alkyl having 1 carbon atom, R^3 is selected from the group of radicals consisting of an alkyl having 1 to 12 carbon atoms and n is an integer of from 0 to 6.

5,068,440

PROCESS FOR THE MANUFACTURE OF N,N-DIMETHYL-1-[1-(4-CHLOROPHENYL)CYCLOBUTYL]-3-METHYLBUTYLAMINE HYDROCHLORIDE MONOHYDRATE

James E. Jeffery, and Derek Whybrow, both of Nottingham, England, assignors to The Boots Company, PLC, Nottingham, England

Division of Ser. No. 342,638, Apr. 19, 1989, Pat. No. 4,929,629, which is a continuation of Ser. No. 938,395, Dec. 5, 1986, abandoned. This application Jan. 19, 1990, Ser. No. 467,471

Claims priority, application United Kingdom, Dec. 17, 1985, 8531071

Int. Cl.[5] C07C *211/00*

U.S. Cl. 564—442 5 Claims

1. A process for the preparation of N,N-dimethyl-1-[1-(4-chlorophenyl)cyclobutyl]-3-methylbutylamine hydrochloride monohydrate comprising recrystallising N,N-dimethyl-1-[1-(4-chlorophenyl)cyclobutyl]-3-methylbutylamine hydrochloride from a medium consisting of or containing water.

5,068,441

N-BENZOYL-N'TRIHALO-HALOALKOXY-PHENYLUREAS AND PESTICIDAL COMPOSITIONS CONTAINING THEM

Josef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

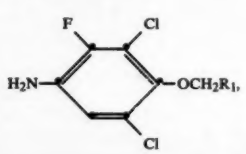
Division of Ser. No. 187,173, Apr. 28, 1988, Pat. No. 4,925,876. This application Feb. 23, 1990, Ser. No. 485,119

Claims priority, application Switzerland, May 8, 1987, 1753/87

Int. Cl.[5] C07C *211/52, 275/54;* A01N *47/34*

U.S. Cl. 564—442 4 Claims

1. A compound of formula II



(II)

wherein R_1 is CF_3, CF_2CF_3 or $CF_2CF_2CF_3$.

5,068,442

METHOD FOR MAINTAINING THE ACTIVITY OF ZEOLITE CATALYSTS

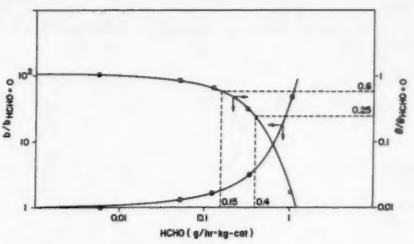
Yoshiro Ashina; Takeyuki Fujita; Kiyonobu Niwa; Takeshi Inagaki, and Yuko Nikaido, all of Yokohama, Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1989, Ser. No. 353,446

Claims priority, application Japan, May 20, 1988, 63-121966

Int. Cl.[5] C07C *45/00*

U.S. Cl. 564—479 6 Claims



1. A method for maintaining the activity of a zeolite catalyst in the catalytic production of methylamines methanol and ammonia using a zeolite catalyst as at least one of catalysts applied, which comprises controlling the amount of formaldehyde as impurities flowing into a zeolite catalyst layer to about 0.15 g/hr.kg-cat. or lower.

5,068,443

PROCESS FOR THE MANUFACTURE OF 2,6-DICHLORO-4-NITROANILINE

Stephen R. Smythe, North Muskegon; Martin G. Cole, Spring Lake, and James S. Grier, Whitehall, all of Mich., assignors to NorAm Chemical Company, Wilmington, Del.

Filed Jun. 1, 1990, Ser. No. 532,035

Int. Cl.[5] C07C *209/74*

U.S. Cl. 564—496 14 Claims

1. A process for the chlorination of a substituted or unsubstituted nitroaniline by reaction with Cl_2 in a reaction medium consisting essentially of acetic acid.

5,068,444

TETRAMINES BY AMINATION OF DIALDEHYDE GLYCOL ADDUCTS

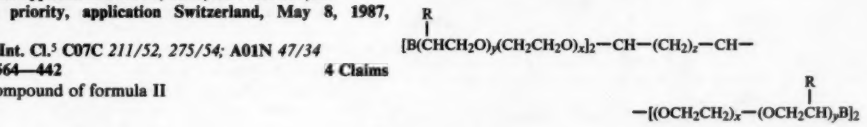
Michael Cuscurida; David R. McCoy, both of Austin, and Jiang-Jen Lin, Houston, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 31, 1989, Ser. No. 429,671

Int. Cl.[5] C07C *215/08, 217/08*

U.S. Cl. 564—505 10 Claims

1. A compound of the formula:



wherein

R is selected from the group consisting of the methyl or ethyl radical,

x ranges from 2 to about 50,

y ranges from 2 to almost 24,

z is 0 to 3, and

B is $—NH_2$ or —OH, and wherein at least one of the B substituents is $—NH_2$.

5,068,445

PROCESS FOR THE PREPARATION OF ORGANIC DISULPHIDES AND POLYSULPHIDES

Emmanuel Arretz, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Apr. 3, 1989, Ser. No. 331,878

Claims priority, application France, Apr. 14, 1988, 88 04962; Sep. 14, 1988, 88 11968

Int. Cl.[5] **C07C** *319/22*

U.S. Cl. 568—21 **17 Claims**

1. A process for the preparation of organic disulphides and polysulphides comprising reacting sulphur with a mercaptan or a polysulphide which is lower in sulphur, in a liquid medium in the presence of a basic catalyst, said catalyst being an anion exchange resin consisting essentially of an organic polymer or copolymer having a basic function.

5,068,446

PROCESS FOR PREPARATION OF DIBROMOPROPYL ETHER COMPOUND HAVING HIGH MELTING POINT

Yoshikatsu Ogawa, Takatsuki; Haruhiko Hisada, Yao; Takeshi Kasahara, Sakai; Fumihiko Kizaki, Osaka, and Masahide Yoshiya, Fujiidera, all of Japan, assignors to Marubishi Yuka Kogyo Kabushiki Kaisha, Osaka, Japan

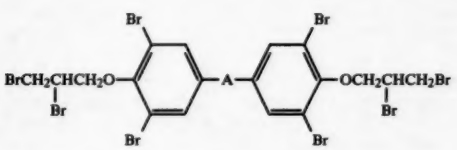
Filed Mar. 30, 1990, Ser. No. 503,386

Claims priority, application Japan, Apr. 28, 1989, 1-107807

Int. Cl.[5] **C07C** *315/06, 41/40*

U.S. Cl. 568—33 **5 Claims**

1. A process for the preparation of a dibromopropyl ether compound having a high melting point, which comprises mixing a bis-dibromopropyl ether of tetrabromobisphenol-sulfone or tetrabromobisphenolpropane represented by the following general formula:



wherein A represents $-SO_2-$ or $-C(CH_3)_2-$,

in the melted state with a crystallized product of said compound at a temperature lower than the melting point of the crystallized product, and holding the mixture at a temperature of 50° to 100° C.

5,068,447

FRIEDEL-CRAFTS PREPARATION OF AROMATIC KETONES WITH AN INOGANIC SALT CONTROLLING AGENT

Heinrich C. Gors, Mountain View; Patrick J. Horner, Menlo Park, and Viktors Jansons, Los Gatos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 293,726, Jan. 5, 1989, abandoned, which is a division of Ser. No. 175,646, Mar. 21, 1988, Pat. No. 4,814,508, which is a continuation of Ser. No. 874,268, Jun. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 789,546, Oct. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 659,598, Oct. 11, 1984, abandoned. This application Jul. 6, 1990, Ser. No. 550,246

Int. Cl.[5] **C07C** *107/06, 49/813*

U.S. Cl. 568—309 **7 Claims**

1. A process for the preparation of an aromatic carbonyl compound having the formula

$(R)_sArDCOBD(R')_t$, $(R)_sArDCOBDCOArD(R)_s$, $(R)_sArDCODAr(R)_s$, or $(R')_tDBCOArDCOBD(R')_t$

wherein each s and t is independently 1, 2 or 3 and each R, Ar, B, D and R' is independently as defined below,

which comprises reacting a first reactant, consisting of a substituted or unsubstituted aromatic compound containing at least one activated hydrogen atom of the formula

$(R)_sArDH$

wherein Ar is a homo or hetero-aromatic mono-, di- or tricyclic moiety or a fused homo-aromatic condensed system containing less than 20 aromatic carbon atoms, or a heteroaromatic system containing less than 8 nitrogen atoms, each R is as defined below and D is

$-(ZAR)_n-(ZAr)_m-(ZAr)_p-$

wherein n, m, and p are each independently 0, 1, 2 or 3, provided that n+m+p is less than 4, and Z is

$-CO-$, $-SO_2-$, $-CO-C_6H_4H4-CO-$ $-CO-C_6H_4CO-$, or $-O(CF_2)_qO-$

or V, provided that when n+m+p>0, any Ar group which contains an activated hydrogen atom is also linked to a V group, where V is a divalent radical of the formula

$-O-$, $-S-$, $-N=N-$, $-(CF_2)_q-$, $-(CH_2)_q-$, or $-C(CH_3)_2-$

wherein q is 1 to 20;

with a second reactant, consisting of phosgene, or a monofunctional acyl compound of the general formula

$YCOBD(R')_t$ or $O(COBD(R')_t)_2$

or a di-functional acy compound of the general formula

YCOBDCOY

wherein each B is independently a divalent substituted or unsubstituted aliphatic or cycloaliphatic group or Ar, and R and R' which may be the same or different are a H, Br, Cl or F atom or a hydroxy, alkoxy, alkyl, aralkyl, unsubstituted or mono- or disubstituted amino, nitro, ester, acid, amide or imide group, and each Y represents a Br, Cl or F atom or a hydroxy or alkoxy group, subject to the proviso that any aromatic ring which contains an activated hydrogen atom also contains no alkoxy groups and to the further proviso that the aromatic carbonyl compound contains less than 2 identical directly linked sequences containing at least one $-SO_2-$ or $-CO-$

in a reaction medium comprising:

(A) an inorganic salt controlling agent in an amount from 0.1 to 4 equivalents per equivalent of acid, ester or acid halide group in the reactants;

(B) a Lewis acid selected from the group consisting of aluminum trichloride, aluminum tribromide, antimony pentachloride, antimony pentafluoride, indium trichloride, gallium trichloride, boron trichloride, boron trifluoride, ferric chloride, stannic chloride, titanium tetrachloride, and molybdenum pentachloride, in an amount of about one equivalent per equivalent of carbonyl, or other basic species in the reactants plus one equivalent per equivalent of Lewis base plus an amount effective to act as a catalyst for the reaction; and

(C) a non-protic diluent in an amount from about 20 to about 93% by weight, based on the weight of the total reaction mixture.

5,068,448
PROCESS FOR THE PRODUCTION OF 4'-ISOBUTYLACETOPHENONE

Daniel D. Lindley, Portland, Tex.; Thomas A. Curtis, Tega Cay, S.C.; Timothy R. Ryan, Corpus Christi, Tex.; Edward M. de la Garza, Corpus Christi, Tex.; Charles B. Hilton, Corpus Christi, Tex., and Thomas M. Kenesson, Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 445,055, Dec. 4, 1989, Pat. No. 4,990,681. This application Oct. 5, 1990, Ser. No. 593,143

Int. Cl.[5] C07C *45/45*

U.S. Cl. 568—319 24 Claims

1. A continuous process for the production of 4 -isobutylacetophenone (4-IBAP) comprising feeding liquid hydrogen fluoride (HF) and an acetylating agent into an extractor-reactor to form a first, HF-rich phase containing said acetylating agent, feeding isobutylbenzene (IBB) to the extractor-reactor to form a second, IBB-rich phase which is contacted with said first, HF-rich phase in a manner such that the acetylating agent reacts with IBB to form 4-IBAP which is extracted into said first, HF-rich phase, and a light IBB-rich second phase containing the bulk of unreacted IBB; externally recycling said second, IBB-rich phase to said IBB feed point in combination with fresh IBB to make up for IBB consumed in the reaction and that dissolved in said HF-rich phase, and withdrawing an HF-rich stream containing 4-IBAP from the extractor-reactor.

5,068,449
FLUORINATED BENZOYL COMPOUNDS

Seisaku Kumai, Fujisawa; Osamu Yokokoji, Yokohama, and Akihiro Tamaoki, Ichihara, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

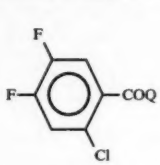
Division of Ser. No. 446,110, Dec. 5, 1989, Pat. No. 4,994,610. This application Feb. 7, 1990, Ser. No. 476,578

Claims priority, application Japan, Aug. 14, 1987, 62-201862; Apr. 15, 1988, 63-91609

Int. Cl.[5] C07C *45/00*

U.S. Cl. 568—335 9 Claims

1. A fluorinated benzoyl compound of the formula:



(I)

wherein Q is a lower alkyl group.

5,068,450
PROCESS FOR THE PREPARATION OF AROMATIC ALDEHYDES

Michel Crochemore, Chaponost, and Christophe Rochin, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 217,699, Jul. 11, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 490,495

Claims priority, application France, Jul. 10, 1987, 87 10180

Int. Cl.[5] C07C *45/00*

U.S. Cl. 568—435 10 Claims

1. A process for the preparation of an aromatic aldehyde comprising the step of contacting an aromatic compound substituted by at least one substituent selected from hydrogen, halogen, alkyl, alkoxy, hydroxyl, perhaloalkoxy, thioalkyl, phenoxy and phenyl with an alkyl formate in liquid hydrofluoric acid and in the presence of boron trifluoride for a time sufficient to form said aromatic aldehyde.

5,068,451
PRODUCTION OF 3-PHENOXY PROPANAL DERIVATIVES

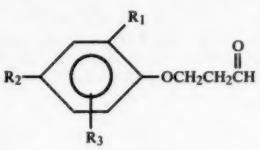
Ivan J. B. Lin, and S. J. Jong, both of Taipei Shien, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed May 4, 1990, Ser. No. 519,177

Int. Cl.[5] C07C *47/02, 45/34*

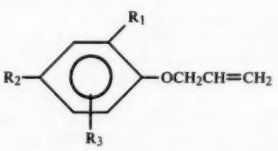
U.S. Cl. 568—442 11 Claims

1. A method of 3-phenoxy propanal derivatives of the formula



(I)

wherein R_1, R_2 and R_3 are —H, —CH_3 or a halogen radical, which method comprises oxidizing allyl phenoxy ether derivatives of the formula



(II)

wherein R_1, R_2 and R_3 are as defined above, in an alcohol as a solvent in the presence of a palladium salt, a copper salt complex oxidant, an alkali metal salt of an organic acid, and an acid at a temperature of 5° C.–100° C. and at a pressure from atmospheric pressure to 10 atm.

5,068,452
AROMATIC ALDEHYDES AND THEIR DERIVATIVES

Ferdinand Naef; François Delay, both of Carouge, Switzerland, and Arnoldus Uijttewaal, St-Genis/Pouilly, France, assignors to Firmenich S.A., Geneva, Switzerland

Filed Apr. 2, 1990, Ser. No. 503,339

Claims priority, application Switzerland, Apr. 12, 1989, 1379/89

Int. Cl.[5] C07C *47/27*

U.S. Cl. 568—442 1 Claim

1. One of the aromatic aldehydes or derivatives thereof selected from the group consisting of:

3-[4-(1-methoxy-1-methylethyl)-1-phenyl]-2-methylpropanal,

3-[4-(1-methoxy-1-methylethyl)-1-phenyl]-2-methylpropionaldehyde dimethylacetal,

3-[4-(1-methoxy-1-methylethyl)-1-phenyl]-2-methylpropionaldehyde diethylacetal,

3-[4-(1-methoxy-1-methylethyl)-1-phenyl]-2-methyl-2-propenal,

3-(4-isopropenyl-1-phenyl)-2-methylpropionaldehyde dimethylacetal, and

3-(4-isopropenyl-1-phenyl)-2-methylpropionaldehyde diethylacetal.

5,068,453
NOVEL MONOTERPENES

Yasumasa Kuwahara, and Walter S. Leal, both of Ibaraki, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

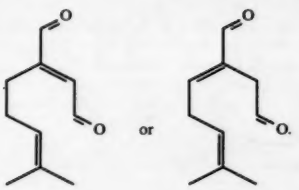
Filed Mar. 9, 1990, Ser. No. 491,459

Claims priority, application Japan, Mar. 13, 1989, 1-60324; Apr. 28, 1989, 1-109938

Int. Cl.[5] C07C *47/21*

U.S. Cl. 568—494 3 Claims

1. A monoterpene of the formula:



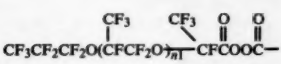
5,068,454

POLYFLUOROALKANOYL PEROXIDE

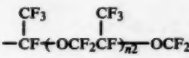
Hideo Sawada, Tsukuba, and Masaharu Nakayama, Tsuchiura, both of Japan, assignors to Nippon Oil & Fats Co. Ltd., Tokyo, Japan

Filed Jun. 15, 1990, Ser. No. 538,996
Claims priority, application Japan, Jun. 27, 1989, 1-162609
Int. Cl.[5] C07C *409/00*
U.S. Cl. 568—566 2 Claims

1. A polyfluoroalkanoyl peroxide having the formula



(I)



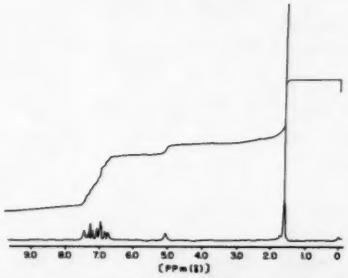
wherein n_1 and n_2 each represent an integer of 0 to 8 and n_1 plus n_2 is 1 or larger.

5,068,455

3-(2-HYDROPEROXY-2-PROPYL)PHENOL AND METHOD OF PRODUCING RESORCINOL USING THE SAME

Kiyotaka Yorozu, Wakicho, and Hiroyasu Ohno, Hiroshima, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 305,185, Feb. 2, 1989. This application Sep. 6, 1990, Ser. No. 578,206
Claims priority, application Japan, Feb. 4, 1988, 63-025441; Nov. 15, 1988, 63-288287
Int. Cl.[5] C07C *407/00, 409/08*
U.S. Cl. 568—567 4 Claims



1. A method of producing 3-(2-hydroperoxy-2-propyl)-phenol which comprises: oxidizing m-isopropenylphenol with hydrogen peroxide at a temperature of from about 0°-100° C. in at least one solvent selected from the group consisting of aliphatic nitriles, aromatic nitriles, aromatic hydrocarbons, acetone and 1,4-dioxane in the presence of an acid catalyst selected from the group consisting of phosphoric acid, polyphosphoric acid, sulfuric acid, heteropolyacids, cation exchange resins, hydrogen boride and boron trifluoride-ether complexes.

5,068,456

PREPARATION OF NONIONIC SURFACTANTS BY OXYALKYLATION WITH A PHENOLIC ACTIVATED MAGNESIUM CATALYST

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Continuation-in-part of Ser. No. 466,098, Jan. 16, 1990, abandoned, which is a continuation of Ser. No. 205,753, Jun. 13, 1988, abandoned. This application Nov. 19, 1990, Ser. No. 615,114
Int. Cl.[5] C07L *41/03*
U.S. Cl. 568—618 4 Claims

1. A method for the alkoxylation of a reactive hydrogen compound selected from the group consisting of monohydric alcohol(s) having between about 6 and about 30 carbon atoms, both branched and linear, with an alkylene oxide having two to four carbon atoms comprising reacting said monohydric alcohol(s) with said alkylene oxide at a temperature at which the reaction proceeds in the presence of at least a catalytic amount of a material consisting of a catalyst that is produced by the reaction of magnesium and a phenolic compound wherein the alkoxylation product has a narrow molecular weight distribution.

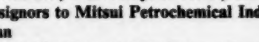
5,068,457

METHOD FOR MAKING HYDROXY-TERMINATED ARYLENE ETHERS

Gary W. Yeager, Schenectady, and David N. Schissel, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

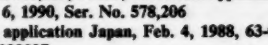
Filed Aug. 1, 1990, Ser. No. 561,403
The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.
Int. Cl.[5] C07C *41/01*
U.S. Cl. 568—633 8 Claims

1. A method for making an hydroxy-terminated arylene ether of the formula,



comprising,

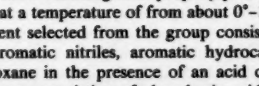
(1) effecting reaction between a dihydroxyaromatic compound of the formula,



and an aryl alkyl ketone of the formula,

to form an arylene ether dicarbonyl adduct of the formula,

(2) oxidizing the resulting arylene ether dicarbonyl adduct of step (1) to form the corresponding arylene ether diester, of the formula,



(3) saponifying the arylene ether diester of step (2) to form

the corresponding hydroxy-terminated arylene ether of the formula,

$$HO—R^1—O—R—O—R^1—OH,$$

where R is a member selected from the class consisting of $C_{(6-30)}$ arylene groups and $C_{(6-30)}$ arylene groups substituted with monovalent radicals inert during hydroxy-terminated arylene-forming reactions, R^1 is a member selected from the class consisting of $C_{(6-20)}$ arylene radicals and $C_{(6-20)}$ arylene radicals substituted with monovalent radicals inert during hydroxy-terminated arylene ether-forming reactions, R^2 is a $C_{(1-8)}$ alkyl radical and Y is a leaving group selected from fluoro, bromo and nitro.

5,068,458

CHEMICAL PROCESS FOR HALOGENATING 2-METHYL-6-METHOXYNAPHTHALENE

John R. M. Dales, and Sidney E. Callander, both of Worthing, England, assignors to Beecham Group p.l.c., Brentford, England

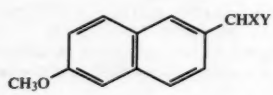
Filed Jun. 28, 1990, Ser. No. 545,298

Claims priority, application United Kingdom, Jun. 30, 1989, 891510417

Int. Cl.[5] C07C *41/22*

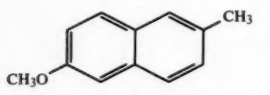
U.S. Cl. 568—634 **5 Claims**

1. A process for the preparation of a compound of formula (I):



(I)

in which X and Y are identical and represent bromine or chlorine or X is bromine or chlorine and Y is hydrogen, which comprises brominating or chlorinating 2-methyl-6-methoxynaphthalene, of formula (II):



(II)

in the presence of a free radical initiator.

5,068,459

PROCESS FOR PRODUCING M-PHENOXYBENZYL ALCOHOL

Ryu Oi; Shinji Takenaka, and Chitoshi Shimakawa, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

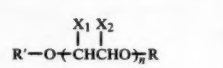
Filed Apr. 17, 1990, Ser. No. 509,843

Claims priority, application Japan, Apr. 19, 1989, 1-97630

Int. Cl.[5] C07C *41/01*

U.S. Cl. 568—638 **4 Claims**

1. In a process for producing m-phenoxybenzyl alcohol by reacting chlorobenzene with m-hydroxybenzyl alcohol in a reaction solvent and in the presence of a copper catalyst and a base, the improvement which comprises using an alkylene glycol of the formula



(I)

wherein R and R′ are independently a hydrogen atom, a methyl group, an ethyl group, a propyl group or a butyl group, X_1 and X_2 are independently a hydrogen atom or a methyl group, and n is an integer of 1-10 as the reaction solvent.

5,068,460

PROCESS FOR PREPARATION OF RESORCINOL

Charles E. Sumner, Jr.; Brenda J. Hitch, both of Kingsport, and Bobby L. Bernard, Rogersville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 509,122, Apr. 16, 1990, abandoned. This application Dec. 6, 1990, Ser. No. 623,003

Int. Cl.[5] C07C *41/01*

U.S. Cl. 568—648 **2 Claims**

1. A process for preparation of resorcinol bis(hydroxyethyl)ether comprising

(A) contacting at a temperature in the range of 130 degrees to 150 degrees C. resorcinol and ethylene carbonate and an alkali metal carbonate,

(B) adding a solution of water and an alkali metal hydroxide which is at least 0.6 molar, and

(C) recovering the resorcinol bis(hydroxyethyl)ether by crystallization.

5,068,461

INSECTICIDAL ETHERS

Michael J. Bushell, Wokingham, and Robin A. E. Carr, Camberley, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Division of Ser. No. 114,038, Oct. 29, 1987, Pat. No. 4,937,388, which is a continuation-in-part of Ser. No. 891,350, Jul. 31, 1986. This application Mar. 29, 1990, Ser. No. 500,883

Claims priority, application United Kingdom, Aug. 9, 1985, 8520027; Oct. 19, 1986, 8625897

Int. Cl.[5] C07C *43/20, 43/215, 43/225*

U.S. Cl. 568—655 **2 Claims**

1. 1,1,1-Trifluoro-2-(4-ethoxyphenyl)prop-2-ene.

5,068,462

FLUORINE-SUBSTITUTED COMPOUND CONTAINING ETHER BOND AND INTERMEDIATE THEREOF

Makoto Sasaki, Saitama; Haruyoshi Takatsu, and Kiyofumi Takeuchi, both of Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals Inc.,, Tokyo, Japan

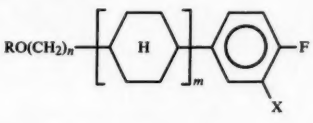
Filed Jul. 26, 1990, Ser. No. 557,336

Claims priority, application Japan, Jul. 28, 1989, 1-196074; Oct. 9, 1989, 1-262225; Dec. 18, 1989, 1-326165; Jan. 25, 1990, 2-15481; Apr. 16, 1990, 2-97648; May 8, 1990, 2-116924

Int. Cl.[5] C07C *43/02*

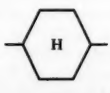
U.S. Cl. 568—661 **5 Claims**

1. A compound represented by formula (I):



(I)

wherein R represents a straight-chain alkyl group having 1 to 8 carbon atoms; n represents an integer of 2 to 7; m represents 1 or 2, X represents a hydrogen atom or a fluorine atom, and



represents a trans(equatorial-equatorial)cyclohexane ring.

5,068,463

PROCESS FOR THE PREPARATION OF TETRABROMO-4,4'-ALKYLIDENEDIPHENOLS

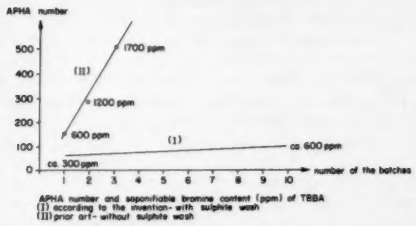
Eberhard Walter, Schifferstrasse 88, D-6000 Frankfurt/Main 70, Fed. Rep. of Germany

Filed Oct. 5, 1990, Ser. No. 592,473

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1989, 3935224

Int. Cl.[5] C07C *37/62, 39/16*

U.S. Cl. 568—726 7 Claims



APHA number and saponifiable bromine content (ppm) of TBBA
(I) according to the invention- with sulphite wash
(II) prior art- without sulphite wash

1. In a process for the production of tetrabromo-4,4'-alkylidenediphenols of high purity which comprises brominating the corresponding 4,4'-alkylidenediphenols with bromine or an aqueous HBr_3 or HBr solution in the presence of a water-immiscible organic solvent or solvent mixture, while HBr is oxidized to bromine by aqueous hydrogen peroxide, dissolving the tetrabromo-4,4'-alkylidenediphenol formed in the reaction in the organic phase, after completion of the reaction, by raising the temperature of the reaction mixture, separating the aqueous phase from the organic phase, cooling the organic phase and thereby crystallizing the tetrabromo-4,4'-alkylidenediphenol and separating the crystals from the mother liquor;

the improvement which comprises washing the organic phase before the crystallization at least once with an aqueous alkali sulphite solution and at least once with water and removing the aqueous phase after each wash.

5,068,464

PROCESS FOR THE OXIDATION OF HYDROCARBONS UTILIZING PARTITIONING OF OXIDIZING GAS

David C. Hendrix, Lake Jackson, Tex., assignor to BASF Corporation, Wyandotte, Mich.

Filed May 26, 1988, Ser. No. 199,844

Int. Cl.[5] C07C *45/33*

U.S. Cl. 568—357 19 Claims

1. In a process for the partial oxidation of hydrocarbons into an oxidate containing oxygenated hydrocarbon products, wherein molecular oxygen is used as the oxidizing agent, the improvement comprising the steps of:

(a) preparing, in a separate vessel, an aqueous solution of oxygen;

(b) contacting said aqueous oxygen solution with a liquid hydrocarbon to be oxidized in such a manner that a substantial quantity of oxygen is transferred from the aqueous phase to the hydrocarbon phase; and

(c) thereafter oxidizing said oxygen-containing hydrocarbon at an elevated temperature.

5,068,465

PHARMACEUTICALLY ACTIVE 3-ARYL-2-FLUORO-1-OLEFINS

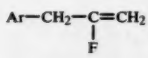
James R. McCarthy, West Chester; Charlotte L. Barney, Cincinnati, and Donald P. Matthews, West Chester, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 384,944, Jul. 25, 1989, Pat. No. 4,981,868. This application Jun. 15, 1990, Ser. No. 539,106

Int. Cl.[5] C07C *39/10, 39/24*

U.S. Cl. 568—765 10 Claims

1. A compound of the formula



(I)

wherein Ar is 3,4-dihydroxyphenyl, 4-hydroxyphenyl, 4-(C_1–C_4) alkoxyphenyl or substituted phenyl, wherein the substituents on the phenyl group are selected from the group consisting of fluoro, chloro, bromo and (C_1–C_4) alkyl.

5,068,466

CYMENOL PREPARATION BY TRANSFER DEHYDROGENATION

Keith R. Motion, Hythe, and Christopher P. Newman, Canterbury, both of Great Britain, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Sep. 6, 1990, Ser. No. 578,495

Claims priority, application United Kingdom, Sep. 6, 1989, 8920109

Int. Cl.[5] C07C *39/06*

U.S. Cl. 568—781 9 Claims

1. A process for the conversion of an 8-hydroxymenthene to an 8-hydroxycymene in which the 8-hydroxymenthene is reacted in the liquid phase in the presence of a dehydrogenation catalyst and an added hydrogen acceptor, wherein the conversion is carried out at a temperature of from 80° to 150° C. and in the absence of acid.

5,068,467

PROCESS FOR PRODUCTION OF SOLID SORBITOL

Yuji Kunimi; Akihiko Tabata, both of Ushiku, and Yatsuka Fujita, Nishinomiya, all of Japan, assignors to K.K. Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Continuation of Ser. No. 312,998, Feb. 21, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 552,361

Claims priority, application Japan, Feb. 20, 1988, 63-38349

Int. Cl.[5] C07C *29/78, 31/26*

U.S. Cl. 568—852 10 Claims

1. A method of production of non-caking crystalline sorbitol which comprises stirring sorbitol seed crystals into melted sorbitol in the presence of 0.5 to 30% by weight based on the melted sorbitol of an addition agent selected from the group consisting of vegetable oils, animal oils, hardened oils, mineral oils, esters of higher fatty acids and higher fatty alcohols, glycerol fatty acid esters, sugar fatty acid esters, sorbitan fatty acid esters, propyleneglycol fatty acid esters, pentaerythritol fatty acid esters, polyglycerol fatty acid esters, polyoxyethylene sorbitan fatty acid esters, polyoxyethylene alkyl ethers, lecithin, soap of higher fatty acid, saponin, casein, polyoxyalkylene alkyl ethers, polyoxyalkylene alkylaryl ethers, polyoxyalkylene alkylamides, polyoxyethylene/polyoxypropylene random or block copolymer, sulfates of polyoxyalkylene ether type nonionic surface active agents, fatty acid esters of polyoxyalkyleneglycols, and alkylalkanolamides, and at a temperature at which the melted sorbitol does not solidify and at which the seed crystals do not melt, cooling the melted sorbitol-seed crystals mixture to about 50° C. to about 85° C. to provide solid sorbitol, aging the solid sorbitol at said temperature of about 50° C. to about 85° C., then cooling the aged solid sorbitol to

room temperature, and then powdering or granulating the solid sorbitol to form the non-caking crystalline sorbitol.

5,068,468

HYDROGENATION OF ACETYLENIC ALCOHOLS

Juergen Schossig, Fussgoenheim; Gerhard Koppenhoffer, Roemerberg; Matthias Irgang, Heidelberg, all of Fed. Rep. of Germany; Rudi Schnur, and George Roley, both of Baton Rouge, La., assignors to BASF Atktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 19, 1990, Ser. No. 599,877

Int. Cl.[5] C07C *29/17, 31/20*

U.S. Cl. 568—861 **3 Claims**

1. A process for the preparation of saturated alcohols by catalytic hydrogenation of acetylenic alcohols at a temperature of from 50° to 200° C. and under a pressure of from 30 to 320 bar, wherein use is made of a catalyst containing from 20 to 85% of nickel oxide, from 0 to 30% w/w of copper oxide, from 1 to 30% w/w of zirconium dioxide, from 1 to 30% w/w of silicon dioxide and from 1 to 30% w/w of aluminum oxide, by weight of the oxidic, unreduced catalyst.

5,068,469

PROCESS FOR PREPARATION OF CONDENSED ALCOHOLS BY ALKOXIDE CATALYSTS

David A. Young; John A. Jung, and Mark L. McLaughlin, all of Baton Rouge, La., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 7, 1990, Ser. No. 476,163

Int. Cl.[5] C07C *29/34, 31/125*

U.S. Cl. 568—878 **5 Claims**

1. A process for preparing a condensed, saturated dimer alcohol having alkyl branching in the 2- position and being represented by the formula $RCH(R)CH_2OH$ which comprises contacting a primary alcohol reactant of the formula RCH_2CH_2OH with a saturated aldehyde of the formula RCHO in the presence of a metal alkoxide at a temperature of about 100° to 220° C., wherein the metal may be potassium, lithium, sodium, rubidium, cesium, magnesium, calcium, strontium, aluminum or gallium and removing water as it is formed during the course of the reaction and recovering therefrom said dimer alcohol, wherein R is alkyl, the alkoxide has 1 to 20 carbon atoms, the primary alcohol and aldehyde having 6 to 17 carbon atoms, the aldehyde being incrementally added to the mixture of alkoxide and primary alcohol so that there is continuously maintained in the reaction mixture about 5–15 mole % of aldehyde based on the total moles of primary alcohol and aldehyde.

5,068,470

PERFLUOROALKENES AND FLUORINATION PRODUCTS THEREOF

Claudio Tonelli, and Vito Tortelli, both of Milan, Italy assignors to Ausimont, S.r.l, Milan, Italy

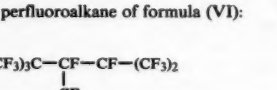
Division of Ser. No. 348,003, Apr. 14, 1989, Pat. No. 5,026,928. This application Oct. 31, 1990, Ser. No. 606,622

Claims priority, application Italy, Aug. 27, 1987, 21726 A/87

Int. Cl.[5] C07C *19/08, 21/18*

U.S. Cl. 570—134 **1 Claim**

1. A ramified perfluoroalkane of formula (VI):



(VI)

said perfluoroalkane being capable of generating perfluoroalkyl radicals at temperatures higher than 100° C.

5,068,471

CONTINUOUS TELOMERIZATION PROCESS

Norbert Paul, Altötting; Rudolf Huber, Garching, and Ingolf Mielke, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1990, Ser. No. 630,178

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942316

Int. Cl.[5] C07C *17/24, 17/26, 17/28, 19/07*

U.S. Cl. 570—139 **5 Claims**

1. A process for continuous telomerization of at least one telogenic compound, which is liquid under the reaction conditions, with at least one taxogenic compound having an ethylenic double bond and 2 to 4 carbon atoms, at a temperature of from 40° to 150° C. and under a pressure of from 0.1 to 3 MPa in the presence of at least one catalyst in an elongate cylindrical reaction space, separation of the reaction mixture after the telomerization reaction has ended and the mixture has left the reaction space, and discharge of the desired higher-molecular telomerization products as well as recycle of the undesired lower-molecular telomerization products and of the unconverted starting substances and reintroduction thereof to the telomerization reaction in a first circulation, the consumed starting substances being made up, which comprises discharging a part of the essentially liquid reaction mixture from that half of the reaction space which is the second in the direction of flow and reintroducing it, without separating off constituents, in a second circulation into that half of the reaction space which is the first in the direction of flow, 20 to 90% of the total length of the reaction space being located between the discharge and the introduction.

5,068,472

MULTISTEP SYNTHESIS OF HEXAFLUOROPROPYLENE

James L. Webster, Parkersburg, W. Va.; Swiatoslaw Trofimenko; Paul R. Resnick, both of Wilmington, Del.; Douglas W. Brubnke, Landenberg; Jan J. Lerou, Chadds Ford, both of Pa.; William H. Manogue, Newark; Leo E. Manzer, Wilmington, both of Del.; Elrey L. McCann, Mendenhall, Pa.; Steven H. Swearingen, Wilmington; James A. Trainham, Newark, both of Del., and Cristobal Bonifaz, Conway, Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1989, Ser. No. 452,404

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.[5] C07C *17/00, 17/08*

U.S. Cl. 570—157 **6 Claims**

1. A process for the preparation of hexafluoropropylene comprising, under effective reaction conditions:

(a) fluorinating or chlorofluorinating $CCl_3CCl{=}CCl_2$, in the presence of a catalyst and by contacting the $CCl_3CCl{=}CCl_2$ with chlorine and hydrogen fluoride to produce perhalogenated C-3 chlorofluorocarbons;

(b) hydrofluorinating any unsaturated chlorofluorocarbons of step (a) by contacting with excess HF in the presence of metal-containing catalyst to saturated perhalogenated chlorofluorocarbons;

(c) fluorinating the saturated perhalogenated chlorofluorocarbons resulting from steps (a) and (b) by contacting with HF in the presence of metal-containing catalyst to produce $CF_3CFClCF_3$; and

(d) hydrodehalogenating said $CF_3CFClCF_3$ to hexafluoropropylene by contacting with hydrogen in the presence of a potassium-containing catalyst.

5,068,473

HYDROGENOLYSIS/DEHYDROHALOGENATION PROCESS

Carl S. Kellner; V. N. Mallikarjuna Rao, and Frank J. Weigert, all of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 305,698, Feb. 3, 1989, abandoned. This application Oct. 17, 1990, Ser. No. 596,551

Int. Cl.[5] C07C *17/24, 17/34, 19/08, 21/13*

U.S. Cl. 570—176 **30 Claims**

1. In a process for the hydrogenolysis of fluorohalocarbons and/or fluorohalohydrocarbons which contain at least one halo group selected from chloro and bromo by reacting the fluoro-halocarbons and/or fluorohalohydrocarbons with a source of hydrogen in the presence of a catalyst, the improvement comprising utilizing a rhenium-containing catalyst selected from the group consisting of (i) catalysts consisting essentially of rhenium, (ii) unsupported catalysts containing at least about 50 percent by weight rhenium with the balance being one or more Group VIII metals, (iii) catalysts consisting essentially of rhenium supported on carbon, alumina, fluorided alumina, aluminum fluoride, or calcium fluoride, and (iv) supported catalysts consisting essentially of one or more Group VIII metals and from 0.1 to 20 percent by weight of rhenium supported on carbon, alumina, fluorided alumina, aluminum fluoride or calcium fluoride, wherein said one or more Group VIII metals total up to 10 percent by weight and rhenium is the major component on said support.

5,068,474

PROCESS FOR THE PURIFICATION OF VINYL CHLORIDE

Michel Strebelle, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed May 31, 1990, Ser. No. 531,458

Claims priority, application France, Jun. 2, 1989, 89 07503

Int. Cl.[5] C07L *17/38*

U.S. Cl. 570—238 **5 Claims**

1. A process for the removal of an unsaturated ester compound exhibiting an enol ester structure from vinyl chloride comprising treating impure vinyl chloride with an alkaline wash followed or accompanied by an aqueous treatment with sodium borohydride.

5,068,475

PROCESS FOR PURIFYING UNREACTED 1,2-DICHLOROETHANE FROM A 1,2-DICHLOROETHANE PYROLYSIS PROCESS

Ludwig Schmidhammer, Haiming; Klaus Haselwarter, Emmerting; Hermann Klaus, Marktl, and Klaus-Peter Mohr, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 5, 1991, Ser. No. 681,186

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1990, 4012538

Int. Cl.[5] C07C *17/38*

U.S. Cl. 570—262 **3 Claims**

1. A process for purifying unreacted 1,2-dichloroethane, containing impurities such as benzene produced at the bottom of the vinyl chloride column in the preparation of vinyl chloride due to incomplete pyrolysis of 1,2-dichloroethane, which comprises

a) bringing said unreacted 1,2-dichloroethane recovered from the pyrolysis of 1,2-dichloroethane into contact with liquid and/or gaseous chlorine in a chlorination reactor in the liquid phase at a residence time of 20 to 150 minutes, at temperatures of from 20 to 80° C., in the presence of an iron catalyst having a bulk density of from 0.1 to 0.5 g/cm^3 and filling the entire reaction space, in such amounts that the unreacted 1,2-dichloroethane leaving the reactor contains excess, free chlorine in dissolved form in concentrations of from 20 to 200 ppm by weight, based on unreacted 1,2-dichloroethane, and

b) purifying the 1,2-dichloroethane treated with chlorine in accordance with a) by acid and alkali washing and by distillative removal of the low- and high-boiling components, including chlorinated benzenes.

2. A process for purifying unreacted 1,2-dichloroethane, produced at the bottom of the vinyl chloride column in the preparation of vinyl chloride due to incomplete pyrolysis of 1,2-dichloroethane, which comprises first treating said unreacted 1,2-dichloroethane with from 0.0001 to 0.01% by weight, based on unreacted 1,2-dichloroethane, of hydroxyl-containing aromatic compounds and subjecting it to a chlorination step and subsequent dechlorination step at temperatures between 0 and 80° C. and pressures of from 0.5 to 6 bar, and then dividing the stream of 1,2-dichloroethane into two parts and only treating a first part of the stream with chlorine as claimed in claim 1*a* and then purifying this first part stream by acid and alkaline washing, then freeing this first part stream, from low-boiling components and passing it to the high-boiling component column, and passing the second part stream directly to the high-boiling component column, avoiding the chlorination step, the washer and the low-boiling component removal step.

5,068,476

LUBRICANT OLIGOMERS OF C_2–C_5 OLEFINS

Margaret M. Wu, Belle Mead, and Suzzy C. Ho, Plainsboro, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 345,061, Apr. 28, 1989, Pat. No. 4,990,709. This application Jan. 29, 1991, Ser. No. 647,102

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] C10L *1/16*

U.S. Cl. 585—12 **20 Claims**

1. A liquid composition comprising the product of the oligomerization of a C_3 to C_5 alpha-olefin, mixtures of C_3 to C_5 1-olefins or mixtures of C_3 to C_5 1-olefins with ethylene, under oligomerization conditions in contact with an oligmerization catalyst comprising a reduced valence state Group VIB metal catalyst on a porous support, the product having a regio-irregularity of at least 20 percent.

5,068,477

PROCESS FOR REDUCING A REFINING CATALYST AND USE OF THE CATALYST IN HYDROGENATION

Georges Berrebi, Bourg Les Valence, France, assignor to Europeenne de Retraitement de Catalyseurs Eurecat, La Voulte Sur Rhone, France

Division of Ser. No. 479,680, Feb. 14, 1990, Pat. No. 5,032,565, which is a continuation-in-part of Ser. No. 356,723, May 25, 1989, abandoned, which is a continuation of Ser. No. 169,260, Mar. 17, 1988, abandoned. This application Apr. 29, 1991, Ser. No. 692,756

Claims priority, application France, Aug. 14, 1987, 87 11633

Int. Cl.[5] C07C *5/03, 5/08*

U.S. Cl. 585—274 **22 Claims**

1. A process for selective hydrogenation of a feed, comprising subjecting said feed to hydrogenation conditions in the presence of a catalyst, wherein said catalyst contains a support and an active phase based on at least one metal of group VIII of the periodic classification elements, and wherein before the catalyst is used, a treatment of said catalyst is carried out comprising in the absence of hydrogen and carbon monoxide:

(a) impregnating the catalyst at between 0° and 50° C. with an aqueous or organic solution of a compound that is a reducing agent selected from the group consisting of aldehydes having 2 to 14 carbon atoms, ketones having 3–18 carbon atoms, polyketones having 3 to 18 carbon atoms, ethers having 2 to 14 carbon atoms, alcohols having 1 to 14 carbon atoms, polyalcohols having 1 to 14 carbon atoms, organic acids having 1 to 14 carbon atoms,

polyacids having 1 to 14 carbon atoms and mixtures thereof, in a manner so as to introduce from 10 ppm to 100% (by weight) of said compound onto the catalyst;

(b) raising the temperature of the thus impregnated catalyst to a temperature between 100° and 150° C. and under a pressure of 1 to 10 bars, thereby reducing the catalyst; and

(c) drying the catalyst to eliminate aqueous or organic solution.

5,068,478

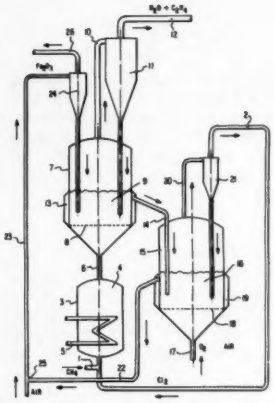
PRODUCING ALKENES AND ALKYNES FROM ALKANES AND ALKENES

Jorge Miller, and Miguel Kling, both of Bogota, Colombia, assignors to Energia Andina, Ltd., Bogota, Colombia

Filed May 25, 1990, Ser. No. 528,603

Int. Cl.[5] C07C *1/00*

U.S. Cl. 585—324 **20 Claims**



1. A process for converting an alkane to a higher molecular weight alkene, which comprises:

a) chlorinating the alkane to produce the corresponding alkane chloride and hydrochloric acid, and

b) reacting the obtained alkane chloride and hydrochloric acid with a metal oxide to form a metal chloride, water vapor and an alkene of higher molecular weight than said alkane.

5,068,479

PREPARATION OF 1,1,3,4,4,6-HEXAMETHYL-1,2,3,4-TETRA-HYDRONAPHTHALENE

Michael Huellmann, Heppenheim; Herbert Mayr, Gross Gronau, and Rainer Becker, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

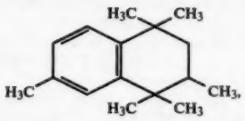
Filed Mar. 13, 1991, Ser. No. 668,484

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008694

Int. Cl.[5] C07C *5/00*

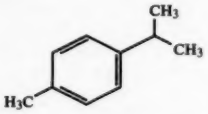
U.S. Cl. 585—411 **6 Claims**

1. A process for preparing 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene of the formula I



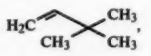
(I)

which comprises reacting p-cymene of the formula II

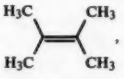


(II)

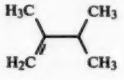
with a hexene of the formula IIIa, IIIb and/or IIIc



(IIIa)

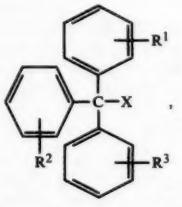


(IIIb)



(IIIc)

in the presence of a catalytic amount of aluminum halide and a catalytic amount of a triphenylmethyl compound of the formula IV



(IV)

where R^1, R^2 and R^3 are each, independently of one another, hydrogen, C_1–C_4-alkyl, nitro or halogen and X is hydrogen or halogen.

5,068,480

PROCESS FOR PRODUCING 2,6-DIMETHYLNAPHTHALENE

Makoto Takagawa; Ken Yamagishi; Jyun Yoshihara; Kenji Inamasa, and Kumiko Watabe, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 3, 1990, Ser. No. 621,260

Claims priority, application Japan, Dec. 2, 1989, 1-310571; Feb. 27, 1990, 2-46857

Int. Cl.[5] C07C *5/00*

U.S. Cl. 585—411 **9 Claims**

1. A process for producing 2,6-dimethylnaphthalene, which comprises subjecting 2-methyl-1-(p-tolyl)-butene, 2-methyl-1-(p-tolyl)-butane or a mixture of these to cyclization and dehydrogenation in the presence of a catalyst comprising lead oxide and/or indium oxide and aluminum oxide.

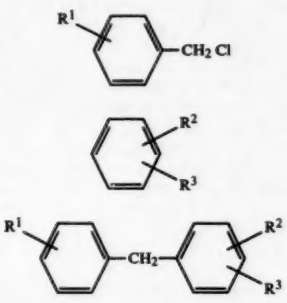
5,068,481

METHOD FOR PRODUCING DIARYLMETHANES

Masahiro Akatsu; Hajime Takayama, and Takeshi Matsuoka, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Japan

Filed Nov. 13, 1990, Ser. No. 611,589
Claims priority, application Japan, Nov. 16, 1989, 1-296142
Int. Cl.[5] C07C *2/02*
U.S. Cl. 585—426 5 Claims

1. In a method for producing diarylmethanes represented by the following general formula (III) by the reaction of a benzyl chloride represented by the following general formula (I) with benzene or an alkylbenzene represented by the following general formula (II):



(I)

(II)

(III)

wherein R^1 to R^3 each stand for a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, the improvement comprising that the catalyst used is an HY or HL type zeolite having a SiO_2/Al_2O_3 molar ratio of 4 to 10 and an alkali metal content of 5% by weight or less, calculated as an alkali metal oxide, or a zeolite obtained by exchanging said HY or HL type zeolite with cations of a di- or tri-valent metal.

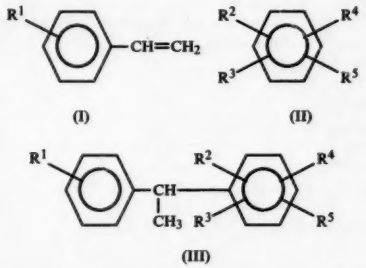
5,068,482

METHOD FOR PRODUCING 1,1-DIARYLETHANES

Masahiro Akatsu; Hajime Takayama, and Takeshi Matsuoka, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Japan

Filed Oct. 1, 1990, Ser. No. 591,172
Claims priority, application Japan, Oct. 2, 1989, 1-255202
Int. Cl.[5] C07C *2/72, 2/02*
U.S. Cl. 585—429 5 Claims

1. In a method for producing 1,1-diarylethanes expressed by the following general formula (III) by the reaction of styrenes expressed by the following general formula (I) with alkylbenzenes expressed by the following general formula (II):



(I)

(II)

(III)

wherein R^1–R^5 each stand for a hydrogen atom or an alkyl group having 1–3 carbon atoms, the improvement comprising using a catalyst which is zeolite L in H form with a SiO_2/Al_2O_3 molar ratio of at least 4, or a zeolite modified by exchanging said zeolite L in H form with a bi- or tri-valent metal ion.

5,068,483

CATALYSTS BASED ON ZEOLITES MODIFIED BY ALKALI METAL ELEMENTS IN THE METALLIC FORM, THEIR PREPARATION, AND THEIR APPLICATION TO ALKYLATION OF ALKYLAROMATIC DERIVATIVES

Denise Barthomeuf, and Viviane Q. de Quivillic, both of Paris, France, assignors to Centre National de la Recherche Scientifique and Societe Nationale Elf Aquitaine, both of Paris, France

PCT No. PCT/FR88/00572, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO89/04716, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 23, 1988, Ser. No. 460,124
Claims priority, application France, Nov. 23, 1987, 87 16191
Int. Cl.[5] C07C *2/68;* B01J *29/04*
U.S. Cl. 585—467 14 Claims

1. Catalysts comprising alkali metal cations and aluminosilicates or gallosilicates having a faujasite structure, which contains a Si/Al or Si/Ga molar ratio of less than 1.5 on an elemental basis, wherein at least 10% of the alkali metal cations are selected from at least one of potassium, rubidium, and cesium cations, further comprising inclusions of at least one alkali metal element in the metallic form.

5,068,484

PROCESS FOR THE HYDROCONVERSION OF A FEEDSTOCK COMPRISING ORGANIC COMPOUNDS HAVING A TENDENCY TO READILY FORM POLYMER COMPOUNDS

Robert B. James, Jr., Northbrook, and Tom N. Kalnes, La Grange, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 2, 1989, Ser. No. 430,394
Int. Cl.[5] C07C *1/20, 1/00*
U.S. Cl. 585—469 33 Claims

1. A process for the hydroconversion of a feedstock comprising organic compounds which are polymer precursors and which process comprises:

(a) contacting said feedstock with a hydrogenated recycle liquid containing dissolved hydrogen in a first hydrogenation reaction zone operated at hydrogenation conditions selected to minimize a hydrogen-rich gaseous phase and to selectively hydrogenate said feedstock comprising organic compounds and to produce a first hydrogenated stream comprising hydrocarbonaceous compounds and having a reduced tendency to produce polymers;

(b) contacting at least a portion of said first hydrogenated stream with a hydrogen-rich gaseous stream in a saturation zone to produce a second hydrogenated stream containing dissolved hydrogen;

(c) introducing at least a portion of said second hydrogenated stream containing dissolved hydrogen into said first hydrogenation reaction zone in step (a) as at least a portion of said hydrogenation recycle liquid;

(d) contacting at least another portion of said second hydrogenated stream containing dissolved hydrogen with added hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce a third hydrogenated stream comprising hydrogenated hydrocarbonaceous compounds and hydrogen; and

(e) recovering said third hydrogenated stream.

5,068,485

ACTIVATION OF METHANE BY TRANSITION METAL-SUBSTITUTED ALUMINOPHOSPHATE MOLECULAR SIEVES

Lennox E. Iton, Downers Grove, and Victor A. Maroni, Naperville, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 16, 1990, Ser. No. 494,380
Int. Cl.[5] C07C *2/00*; B01J *37/34*
U.S. Cl. 585—500 **14 Claims**

1. A process for converting methane (CH_4) to C_{2+} hydrocarbons using a molecular sieve having a template, said process comprising the steps of:

calcining a transition metal-substituted aluminophosphate molecular sieve at 500–550° C. in flowing air to remove the template or any coke that is present and to oxidize the transition metal to the trivalent state, wherein the transition metal is selected from the group consisting of cobalt, manganese or iron and the aluminophosphate molecular sieve is either $AlPO_4$-34 or $AlPO_4$-5 or equivalent $AlPO_4$ structure;

passing CH_4 over the aluminophosphate molecular sieve at 400 to 500° C., whereby the transition metal is reduced to a divalent state and the CH_4 is converted to C_{2+} hydrocarbons.

5,068,486

PROCESS FOR DIRECT OXIDATIVE CONVERSION OF METHANE TO HIGHER HYDROCARBONS AT HIGH PRESSURE AND MODERATE TEMPERATURE

Scott Han, Lawrenceville; Daniel J. Martenak, Trenton; Robert E. Palermo, Bloomfield, all of N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Oct. 15, 1990, Ser. No. 597,221
Int. Cl.[5] C07C *2/00*
U.S. Cl. 585—500 **8 Claims**

1. A process which takes place in the absence of a catalyst for converting methane to hydrocarbons having at least two carbon atoms, said process comprising contacting said methane with an oxidizing agent in the absence of a catalyst under conditions sufficient to produce said hydrocarbons, said conditions including a temperature of from about 500° to about 700° C. and a pressure of from about 20 to about 150 atmospheres.

5,068,487

OLEFIN OLIGOMERIZATION WITH BF_3 ALCOHOL ALKOXYLATE CO-CATALYSTS

Kevin J. Theriot, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 19, 1990, Ser. No. 554,727
Int. Cl.[5] C07C *2/04*
U.S. Cl. 585—510 **21 Claims**

1. A process for making an α-oligomer comprising contacting a straight-chain α-olefin monomer containing from about 6 to 20 carbon atoms with a catalyst comprising boron trifluoride and alcohol alkoxylate so as to form an oligomer product which is predominantly dimer and trimer of said α-olefin monomer wherein the dimer to trimer ratio is greater than about 1.

5,068,488

OLEFIN ETHYLATION PROCESS

Lynn H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 2, 1990, Ser. No. 517,772
Int. Cl.[5] C07C *2/24*
U.S. Cl. 585—516 **13 Claims**

1. A process for ethylating detergent range olefins which comprises contacting a detergent-range olefin with ethylene in the presence of a catalyst prepared by impregnating a porous alumina support with a metal compound decomposable to an oxide upon calcination wherein said metal is selected from the group consisting of potassium, rubidium, cesium and mixtures thereof, and subsequently calcining the resulting material at a temperature of from about 450° C to about 750° C.

5,068,489

PREPARATION OF VERY LOW MOLECULAR WEIGHT POLYETHYLENE IN A FLUIDIZED BED

David N. Edwards, Charleston, W. Va.; Robert J. Jorgensen, Belle Mead, N.J.; Kiu H. Lee, South Charleston, and Arthur E. Marcinkowsky, Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 28, 1989, Ser. No. 458,390
Int. Cl.[5] C07C *2/02*
U.S. Cl. 585—524 **61 Claims**

1. A continuous process for producing ethylene copolymers having a melt index of from g/10 minutes to 2500 g/10 minutes which comprises copolymerizing ethylene and at least one higher alpha-olefin, by continuously contacting, in a fluidized bed, at a temperature of from 10° C. up to 110° C. and a pressure no greater than 7,000 kPa, a gaseous mixture containing

(a) ethylene and at least one higher alpha-olefin containing from 3 to 8 carbon atoms in a molar ratio of such higher alpha-olefin to ethylene of from 0.01:1 to 2 1, and

(b) from 30 mol percent to 90 mol percent hydrogen,

with

(I) particles of a catalyst system comprising a precursor composition having the formula

$$Mg_mTi(OR'')_nX_p[ED]_q$$

wherein R'' is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms, or COR''' wherein R''' is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms,

X is selected from the group consisting of Cl, Br, I, and mixtures thereof,

ED is an organic electron donor compound selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cycloaliphatic ethers and aliphatic ketones,

m is 0.5 to 56,

n is 0, 1 or 2,

p is 2 to 116, and

q is 2 to 85,

said precursor composition being diluted with an inert carrier material and completely activated with an organoaluminum compound having the formula

$$Al(R'''')_dX'_eH_f$$

wherein X' is Cl or OR'''',

R'''' and R''''' are saturated hydrocarbon radicals containing from 1 to 14 carbon atoms,

e is 0 to 1.5,

f is 0 or 1, and

d+e+f=3,

said activator compound being employed in an amount such as to provide a total aluminum:titanium atomic ratio in the fluidized bed of from 10:1 to 400:1; and

(II) a dialkylzinc compound having the formula

$$ZnRR'$$

wherein R and R' are alkyl radicals containing from 1 to 12 carbon atoms, said dialkylzinc compound being employed in an amount such as to provide an atomic ratio of zinc:titanium of from 3:1 to 40:1.

5,068,490

BF3-TERTIARY ETHERATE COMPLEXES FOR ISOBUTYLENE POLYMERIZATION

Bruce E. Eaton, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 396,380, Aug. 18, 1989, abandoned, which is a continuation of Ser. No. 162,046, Feb. 29, 1988, abandoned. This application Jun. 6, 1990, Ser. No. 534,696

Int. Cl.[5] C07C *2/08*

U.S. Cl. 585—525 10 Claims

1. A process to form a product which is essentially polyisobutylene containing at least about 80 percent vinylidine, which process comprises polymerizing isobutylene or a mixed C_4 hydrocarbon feedstock containing at least about 5 weight % isobutylene and up to 20 parts per million water with a boron trifluoride etherate complex wherein the ether of said complex has at least one tertiary carbon bonded to the ether oxygen.

5,068,491

BUS BAR FOR POWER SUPPLY WITH COOLANT FLOW PASSAGES

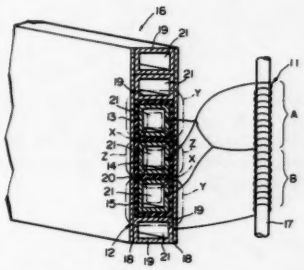
Yoshinori Ogata, Matsudo; Yutaka Kikuchi, Mito; Tsutomu Makino, Katsuta; Teruo Kobayashi, and Hirotaka Yoshida, both of Yokohama, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan; Ishikawajima-Harima Heavy Industries Co., Ltd. and Dai-Ichi High Frequency Co., Ltd., all of Tokyo, Japan

Filed Jul. 5, 1990, Ser. No. 548,550

Claims priority, application Japan, Jul. 5, 1989, 1-79283[U]

Int. Cl.[5] H02G *5/10*

U.S. Cl. 174—16.2 13 Claims



6. A bus bar for power supply comprising an outer conductor, a plurality of inner conductors inserted in said outer conductor, and an insulation layer filling every space between opposite surfaces of adjacent conductors for electrically isolating said conductors from each other;

said inner conductor and outer conductor being formed in a rectangular cross-sectional pipe shape, and conductor surfaces being arranged parallel to each other;

said inner conductor serving as a coolant flow passage.

5,068,492

CONTAINER HAVING A HOT WALL WITH A HIGH-TEMPERATURE-TOLERANT CURRENT PASS-THROUGH

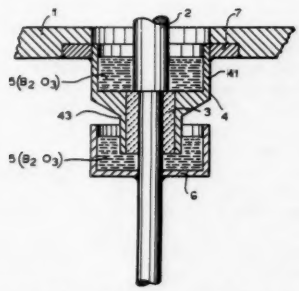
Lothar Britz, Hauset, Belgium; Wolfgang Krug, and Johann Seferiadis, both of Jülich, Fed. Rep. of Germany, assignors to Forschungzentrum Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 479,085

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1989, 3904195

Int. Cl.[5] H01B *17/30*

U.S. Cl. 174—31.5 6 Claims



1. High-temperature-tolerant current pass-through in combination with a container with a hot wall (1) through which a rodlike electrode (2) passes substantially perpendicularly to said wall, wherein

a generally cylindrical bushing (3) of electrically insulating material is tightly fitted around said electrode (2);

said electrode (2) projects out of said bushing (3) at least at a container-adjacent end of said bushing;

said bushing (3) is tightly fitted into a concentrically surrounding wall element (4) having a pair of ends of differing diameters, a larger-diameter end of said element being sealed to said hot wall (1), said larger-diameter end defining between itself and said electrode a generally annular cavity which is at least partly filled with sealing material (5) which will tolerate a temperature of at least 500° C.

5,068,493

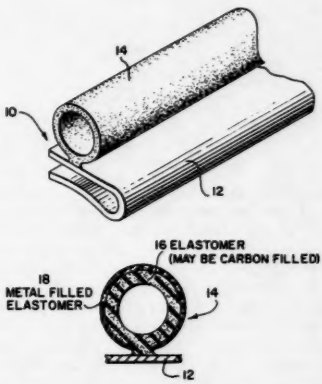
DUAL ELASTOMER GASKET SHIELD FOR ELECTRONIC EQUIPMENT

Robert C. Benn, Sr., and Robert C. Benn, Jr., both of Danbury, Conn., assignors to Vanguard Products Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 269,350, Nov. 10, 1988, Pat. No. 4,968,854. This application Oct. 17, 1990, Ser. No. 599,195

Int. Cl.[5] H05K *9/00*

U.S. Cl. 174—35 GC 19 Claims



1. In a gasket shield for counteracting electromagnetic interference comprising a flexible gasket element, the improvement wherein said gasket element comprises a relatively thick elastomeric inner layer of good elasticity and strength, and a very thin outer layer integral therewith, said outer layer comprising a synthetic polymeric material filled with metallic flakes oriented parallel to said outer layer and providing a high degree of attenuation of electrical energy.

5,068,494

CONDUIT CONNECTOR FOR ECCENTRICALLY DIMENSIONED CONDUIT

Jay J. Bolante, Chicago, Ill., assignor to Appleton Electric Company, Chicago, Ill.

Filed Jun. 27, 1990, Ser. No. 545,358

Int. Cl.[5] H02G *15/13*

U.S. Cl. 174—65 SS 12 Claims

1. A connector assembly for connecting eccentrically dimensioned, liquid-tight flexible electrical conduit to an electrical fixture, comprising:

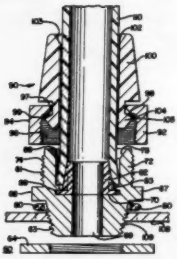
(a) a metal connector body including: a first portion formed with a means for connecting said connector body to the electrical fixture; a central portion, the first and central portions having a centrally located, axially extending bore; and a second portion having a ring member formed with a first set of screw threads, the ring member having a deflection ramp formed thereon, and defining a recess inside the second portion of said connector body;

(b) a plastic sleeve support, having a corner edge on the top outer end thereof and inserted inside the recess of said connector body, and forming an extension of the axially extending bore such that a first annular cavity is formed between the ring member and the sleeve support;

(c) a connector cap comprising:

(i) a metal collar formed with a second set of screw threads engagable with the first set of screw threads on the connector body second portion, and a flanged lip extending inwardly along the top surface of said metal collar;

(ii) a plastic floating sleeve including: an upper tapered portion; a lower portion having a wedging ring having a leading edge at substantially the distal end thereof; and a recess defined along the exterior surface of said floating sleeve between the upper and lower portions, the upper and lower portions having an axially extending, centrally located bore, the wedging ring being coextensive with the bore;



(iii) the recess of said floating sleeve engaging the flanged lip of the collar to form said connector cap, wherein said floating sleeve can move laterally and pivotably with respect to said collar, and the wedging ring and said collar form a second annular cavity therebetween;

(d) the bore of said connector cap and the recess of said connector body being adapted to receive a conduit; the second set of screw threads being engagable with the first set of screw threads to join said connector cap to said connector body; the wedging ring being deformed inwardly by the deflection ramp as said connector cap is screwed into engagement with said connector body such that the leading edge of the wedging ring deflects the conduit wall, forming a locking engagement and liquid-tight seal with the exterior surface of the conduit thereat, forcing the conduit into the first annular cavity to form a liquid-tight seal therein, and forming a locking engagement and liquid-tight seal between the corner edge of said sleeve support and the interior surface of the deflected conduit.

5,068,495

JUNCTION BUS FOR CABLE CONNECTIONS, IN PARTICULAR FOR CABLE CONDUITS

Ursula Dahl-Bettermann-Winand, Wiesenweg 39, D-5064 Rösrath, Fed. Rep. of Germany

PCT No. PCT/DE87/00590, § 371 Date Jun. 16, 1989, § 102(e) Date Jun. 16, 1989, PCT Pub. No. WO88/04853, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 12, 1987, Ser. No. 372,356

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642895

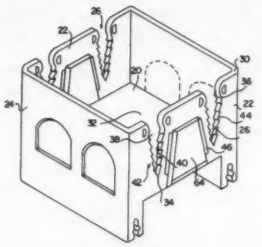
Int. Cl.[5] H02G *3/08*

U.S. Cl. 174—65 R **9 Claims**

1. A junction box for cable connections, comprising;

a base; and

at least one side wall attached to the base, said at least one side wall defining a V-shaped recess for receiving a cable, said recess being open to an upper edge of the at least one side wall and becoming narrower toward the base, said recess having an entry region at the upper edge and a retention region toward the base, sides of the recess at the retention region defining retention projections for resisting movement of the cable toward the entry region, said at



least one side wall further defining at least one slit adjacent one of the sides of the recess, whereby insertion of the cable into the recess causes deformation of the at least one slit and thereby imparts elasticity to said one of the sides of the recess.

5,068,496

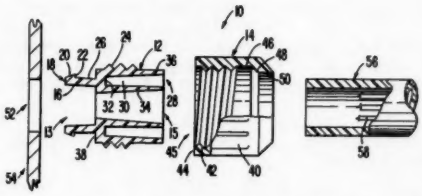
SNAP-IN CONNECTOR

Mark L. Favalora, Niantic, Conn., assignor to Hubbell Incorporated, Orange, Conn.

Filed Oct. 31, 1990, Ser. No. 607,280

Int. Cl.[5] H02G *3/22*

U.S. Cl. 174—65 R **31 Claims**



1. A connector for coupling an electrical conduit to a support having an aperture, the combination comprising:

a one-piece, tubular body member with a longitudinal axis and first and second ends having

a plurality of resilient legs with radially extending locking tongues thereon, said legs being located at said first end and being adapted to extend through the aperture,

external threads disposed between said first and second ends, and

receiving means, disposed on said second end, for receiving the conduit therein; and

a one-piece, tubular take-up nut with first and second ends having

an abutment surface disposed on said first end of said nut, and

internal threads disposed between said first and second ends of said nut and threadedly engaging said external threads on said body member,

whereby said locking tongues and said abutment surface can clamp opposing sides of the support adjacent the aperture.

5,068,497

ELECTROSTATIC FILTER CABLE

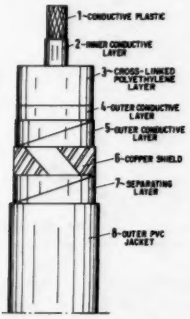
Wolfgang Krieger, Obrigheim, Fed. Rep. of Germany, assignor to Abb Kabel und Draht GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 577,940

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, 3929450

Int. Cl.[5] H01B *1/06, 7/18*

U.S. Cl. 174—106 R **11 Claims**



1. Electrostatic filter cable for an electrostatic filter system, comprising an internal electrical conductor formed of an electrically conductive plastic with a specific resistance in a range of substantially from 2 to 200 Ω mm^2/m, an insulation of cross-linked polyethylene disposed on said internal electrical conductor, an outer conductive layer disposed on said insulation, a copper shield disposed on said outer conductive layer, and an outer PVC jacket disposed on said copper shield.

11. Electrostatic filter cable for an electrostatic filter system, comprising an internal electrical resistor formed of an electrically conductive plastic with a specific resistivity in a range of substantially from 2 to 200 Ω mm^2/m, an insulation of cross-linked polyethylene disposed on said internal electrical resistor, an outer conductive layer disposed on said insulation, a copper shield disposed on said outer conductive layer, and an outer PVC jacket disposed on said copper shield.

5,068,498

JOYSTICK FOR MOUNTING ON DUAL-WIDTH PANELS

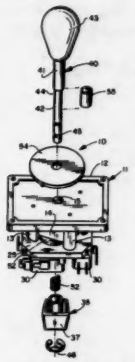
Raul R. Engel, Skokie, Ill., assignor to Wico Distribution Corp., Niles, Ill.

Filed Aug. 14, 1990, Ser. No. 566,774

Int. Cl.[5] H01H *25/04*

U.S. Cl. 200—6 A **14 Claims**

1. A joystick adapted to be mounted on a first panel of a given thickness or a second panel of greater thickness, said joystick comprising a frame for mounting beneath and to a selected panel, a shaft extending through said frame and having a larger-diameter first shaft portion and a smaller-diameter second shaft portion, each of said shaft portions having a free end, means pivotally mounting said second shaft portion to said frame, a handle on the free end of said first shaft portion, actuating means on said second shaft portion, switch means mounted on said frame and being positioned and arranged to be selectively engaged by said actuating means as said shaft is pivoted, a bushing having an inside diameter slightly greater than the diameter of said second shaft portion, said bushing being located on said second shaft portion adjacent to the free end thereof when said joystick is mounted on a first panel, said



bushing being located on said second shaft portion at the other end thereof when said joystick is mounted on a second panel.

5,068,499

CONTROL LEVER TYPE INPUT DEVICE

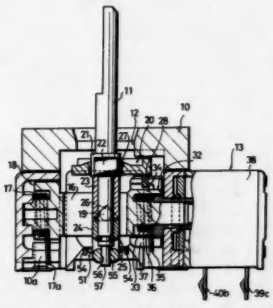
Junichi Kuratani, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1990, Ser. No. 497,058

Claims priority, application Japan, Apr. 14, 1989, 1-43100[U]; Apr. 14, 1989, 1-43101[U]

Int. Cl.[5] H01C *10/00;* **H01H** *25/00*

U.S. Cl. 200—6 A **7 Claims**



1. A control lever type input device comprising:

a case;

a driving shaft rotatably mounted in said case, said driving shaft operably coupled to a first output means for producing a first output related to the rotation of said driving shaft;

an outer shaft rotatably mounted over said driving shaft, said outer shaft operably coupled to a second output means for producing a second output related to the rotation of said outer shaft; and

a control lever pivotably and rotatably mounted in said case, said control lever having a portion extending outside of said case, said control lever being operably coupled to said driving shaft such that when said control lever is pivoted in a predetermined direction, said driving shaft is rotated, thereby producing said first output, said control lever also being operably coupled to said outer shaft such that when said control lever is rotated, said outer shaft is rotated about said driving shaft, thereby producing said second output.

5,068,500

WIPER DRIVING APPARATUS

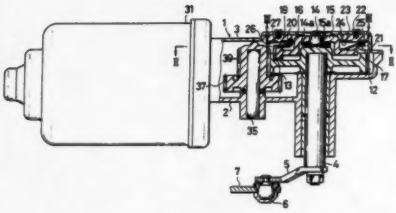
Katsuyoshi Kitada, Kiryu, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Sep. 12, 1989, Ser. No. 405,962

Claims priority, application Japan, Sep. 16, 1988, 63-121492[U]

Int. Cl.[5] H01H *19/00*; B60S *1/00*

U.S. Cl. 200—19 R **8 Claims**



1. A wiper driving apparatus driven by an electric motor comprising,

a driving gear driven by said electric motor, said driving gear providing a driving force and being fixed to a rotatable shaft, said shaft having a rotational axis and being drivingly connected to a wiper,

a clutch member rotatably supported on an axle, said axle being in axial alignment with said shaft,

means for engaging said driving gear with said clutch member such that the driving force of said driving gear is transmitted to said clutch member to rotate said clutch member together with said driving gear in only one predetermined direction of rotation of said driving gear,

an insulation substrate spaced from said clutch member, electrically conductive plates supported on said substrate and being of a form that is coaxial with respect to said support axle,

a moving-contact segment joined to said clutch member for rotation with said clutch member relative to said conductive plates, said moving-contact segment having a contact portion in electrically conductive slidable contact with said conductive plates at a contact position such that said moving-contact segment and said conductive plates constitute part of a switch for opening and closing an electric circuit for operating said motor,

said means for engaging said driving gear with said clutch member including a driver engaging projection provided on said driving gear and a driven engaging projection provided on the clutch for engagement with said driver engaging projection at an engagement position differing in phase from the contact position between said moving-contact segment and said conductive plates by an angle of at least 90°.

5,068,501

TAPE END SWITCH DETECTING DEVICE FOR TAPE PLAYER

Susumu Yoshida; Sei Onishi, and Kenji Uchiyama, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 377,872

Claims priority, application Japan, Jul. 28, 1988, 63-99078[U]

Int. Cl.[5] H01H *3/16*

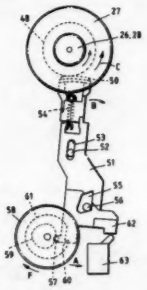
U.S. Cl. 200—61.58 R **2 Claims**

1. A tape end detecting device for operating a switch when a tape in a tape player reaches the end of its travel, said tape end detecting device comprising:

a wheel rotating in one direction irrespective of the direction of travel of the tape;

a pivotable arm pivotable about a pivot point thereof and having a first surface engageable with said wheel, whereby said wheel provides a biasing force to pivot said pivotable arm in a first angular direction about said pivot point when said wheel is rotating and in engagement with said first surface;

means biasing said pivotable arm to urge said first surface to engage said wheel;



cam follower means attached to said pivotable arm at a point thereon on the opposite end of said pivot point from said surface;

cam means engageable with said cam follower for causing said pivotable arm to actuate said switch when said wheel stops rotating.

5,068,502

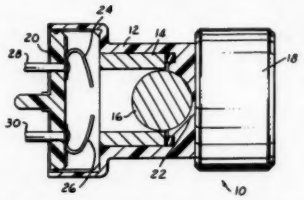
MAGNETICALLY BIASED VELOCITY CHANGE SENSOR

Thomas A. Davenport, Chatham, Canada, assignor to Siemens-Bendix Automotive Electronics Limited, Ontario, Canada

Filed Nov. 13, 1989, Ser. No. 435,102

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 M **4 Claims**



1. In a velocity change sensor of the type comprising a tube having a circular cylindrical inside diameter containing a magnetically permeable sphere whose diameter is just slightly less than the tube's inside diameter so that travel of said sphere within said tube is damped by gaseous fluid present within said tube, a magnet for biasing said sphere axially within said tube against a stop proximate one axial end of said tube, a switch disposed proximate the opposite axial end of said tube for actuation by said sphere in response to said sensor experiencing a velocity change of sufficient magnitude and duration to cause said sphere to overcome the bias of said magnet and travel within said tube from the position against said stop to a position causing said switch to give a signal indicative of the occurrence of such velocity change, the improvement comprising said sphere consisting of iron having a density of essentially 5.7 grams per cubic centimeter.

3. In a velocity change sensor of the type comprising a tube having a circular cylindrical inside diameter containing a magnetically permeable sphere whose diameter is just slightly less than the tube's inside diameter so that travel of said sphere within said tube is damped by gaseous fluid present within said tube, a magnet for biasing said sphere axially within said tube against a stop proximate one axial end of said tube, a switch

disposed proximate the opposite axial end of said tube for actuation by said sphere in response to said sensor experiencing a velocity change of sufficient magnitude and duration to cause said sphere to overcome the bias of said magnet and travel within said tube from the position against said stop to a position causing said switch to give a signal indicative of the occurrence of such velocity change, the improvement comprising said gaseous fluid consisting of a carbon dioxide-neon mixture that is essentially free of other gases and can range from essentially all carbon dioxide to essentially all neon.

4. In the method of making different models of velocity change sensors of the type comprising a tube having a circular cylindrical inside diameter containing a magnetically permeable sphere whose diameter is just slightly less than the tube's inside diameter so that travel of said sphere within said tube is damped by gaseous fluid present within said tube, a magnet for biasing said sphere axially within said tube against a stop proximate one axial end of said tube, a switch disposed proximate the opposite axial end of said tube for actuation by said sphere in response to said sensor experiencing a velocity change of sufficient magnitude and duration to cause said sphere to overcome the bias of said magnet and travel within said tube from the position against said stop to a position causing said switch to give a signal indicative of the occurrence of such velocity change, wherein the different models are characterized by different velocity response characteristics, the improvement which comprises making all such models from spheres of identical mass and diameter and from tubes of identical inside diameter and length, and filling each model with a gaseous fluid of a viscosity that is unique to the particular model, wherein the gaseous fluid filling each model comprises a mixture consisting essentially of two gases of different viscosity whose relative proportions are varied for different models, said mixture is a carbon dioxide-neon mixture that is essentially free of other gases and can range from essentially all carbon dioxide to essentially all neon.

5,068,503

HIGH-PRESSURE SENSOR FOR FLUID CONDITIONS AND METHOD AND APPARATUS USING SAME

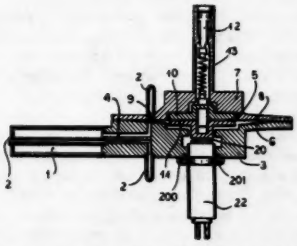
Hans Sladky, Wischhofstieg 7, 2000-Hamburg 65, Fed. Rep. of Germany

Filed Jul. 17, 1989, Ser. No. 381,113

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911795

Int. Cl.[5] G01L *9/10*; **H01H** *35/40*

U.S. Cl. 200—83 L **18 Claims**



1. A pressure sensor comprising an upper housing having an upper membrane contact surface, a lower housing having a lower membrane contact surface, said upper and lower housings joined to provide a chamber therebetween, a flexible membrane within said chamber having a circumferential portion clamped between the joined upper and lower housings, an upper membrane holding plate and a lower membrane holding plate centrally attached to opposite sides of said membrane, said upper housing including a recess for receiving said upper membrane holding plates upon upward deflection of said membrane, said upper membrane contact surface limiting the maximum upward movement of said membrane by contact therewith and said lower membrane contact surface limiting the maximum downward movement of said membrane by contact therewith, means for applying respective pressures to opposite sides of said membrane whereby said membrane is displaced between said upper and lower membrane contact surfaces by a pressure differential thereacross, a member connected to said membrane for movement thereby in response to the pressure differential across said membrane, and a proximity switch mounted on one of said housings spaced juxtaposed said member, said switch responsive to the movement of said member by said membrane to provide an output indicative of the pressure differential across said membrane.

5,068,504

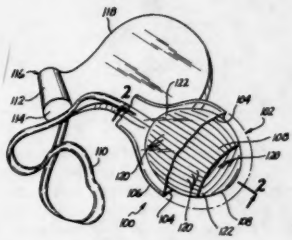
SEAT CUSHIONS AND BODY SUPPORTS, AND FITTING INSTRUMENTS FOR THE SAME

John E. Rogers, P.O. Box 1437, Blue Jay, Calif. 92317

Continuation of Ser. No. 323,672, Mar. 15, 1989, abandoned. This application Mar. 1, 1990, Ser. No. 486,690

Int. Cl.[5] H01H *3/02*

U.S. Cl. 200—85 R **4 Claims**



1. An improved peak pressure sensor for use with body support devices, comprising:

an inflatable envelope comprised of two pliant impermeable sheets sealed along common edges;

substantially pliable electrically conductive sheets affixed to opposing inner surfaces of said envelope in mutually facing relationship;

conductor means for electrically connecting said conductive sheets to an alarm circuit;

a fluid permanently sealed in said envelope and pressurizing said envelope to a predetermined internal pressure so as to normally hold apart said conductive sheets;

wherein said conductive sheets are thin metallic sheets slit within a central area thereof into thin strips held together by a common continuous periphery of the sheet;

whereby said metallic sheet provides a relatively large and substantially continuous contact area compliant to three dimensional cupping and responsive to peak pressure levels acting on any arbitrarily small portion of said central area by actuating an electrical alarm circuit connected between said sheets;

characterized in that said metallic sheets are slit in mutually transverse directions so that electrical contact can be achieved at a intersection between any two strips on the opposite sheets when said impermeable sheets are pressed together to thereby respond to localized peak pressures on said central area rather than average pressure distributed over said central area.

5,068,505

ALTERNATE ACTION PUSHBUTTON SWITCH

Ralph Ipcinski, Hollis, N.H., assignor to C & K Components Inc., Newton, Mass.

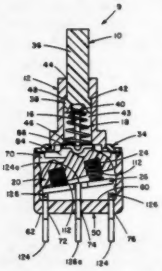
Filed Nov. 16, 1990, Ser. No. 614,241

Int. Cl.[5] H01H *13/56*

U.S. Cl. 200—525 **3 Claims**

1. An alternate action push-button switch comprising a

plunger, a bushing, a housing, a pawl pin, a return spring, a cam, first and second contact springs, a movable contact, first and second contact terminals, a center contact terminal and a bracket, the bushing includes a passage and an open, second terminal end, a portion of the plunger is positioned within the passage, the pawl pin being positioned within the passage, having a terminal end, bearing against the plunger and being circumscribed by the return spring, the bracket has an aperture formed therethrough, the terminal end of the pawl pin coaxially aligned with the aperture, the bracket being engaged to the bushing and covering its second terminal end, the return spring abutting the bracket, the housing including a base which is engaged to the first, second and center contact terminals, the center contact terminal having a prime free terminal and, the



first contact terminal having a first terminal end and the second contact terminal having a second terminal end, the first and second terminal ends being positioned on the same horizontal plane and the prime free terminal end positioned on a horizontal plane above the first and second terminal ends, the movable contact being positioned on the prime free terminal end, the cam having an upper face and a lower surface, the lower surface having a pair of spaced blind apertures formed therein, a contact spring being mounted in each blind aperture and being against the movable contact, the upper face provides cam surfaces whereby activation of the plunger will cause the pawl pin to engage the cam surfaces shifting the movable contact from its engagement with one contact terminal end to the other contact terminal.

5,068,506

SWITCH HAVING A LOCKING MECHANISM

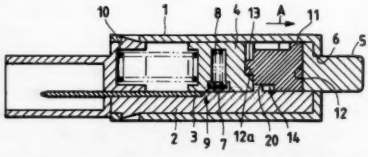
Akira Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 381,250, Jul. 18, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 642,549

Claims priority, application Japan, Jul. 28, 1988, 63-100804

Int. Cl.[5] H01H *13/58, 19/62*

U.S. Cl. 200—526 **16 Claims**



1. A locking assembly suitable for use in a switch mechanism having a first contact and a second contact, comprising:

a casing including means for coupling to the second contact;

means for holding the first contact, the holding means and the casing together defining a chamber in the casing, and being unrotatably disposed in the casing to be slidable in a longitudinal axis of the casing allowing selective contact between the first and second contacts;

means for biasing the holding means toward a first position;

a rotor, rotatably provided in the chamber in the casing on an axis parallel with the longitudinal axis of the casing, and having a groove on an outer periphery, the groove having a plurality of oblique portions and a locking part; and

a locking means extending into the groove of the rotor in a direction orthogonal to the axis of the rotor, the locking means being disposed to slide relative to the rotor along the oblique portions in accordance with movement of the holding means, thereby rotating the rotor, wherein when the holding means is pressed from a first position, the rotor rotates such that upon release from pressing the holding means is moved by the biasing means and the locking means engages with the locking part of the rotor to maintain the holding means in a second position, and when the holding means is pressed from the second position, the locking means disengages from the locking part of the rotor while rotating the rotor such that upon release from pressing the holding means is moved to the first position by the biasing means.

5,068,507

ELECTROSLAG SURFACING

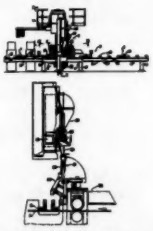
Ian R. Dick, Linden Park; Ian D. Henderson, Glen Osmond; Gordon L. Kimpton, Glenalta, and David S. Wyatt, Woronora, all of Australia, assignors to Commonwealth Sceentific and Industrial Research Organisation, Campbell and Vida-Weld Pty. Limited, Caringbah, both of, Australia

Continuation of Ser. No. 478,008, filed as PCT/AU88/00465 Dec. 3, 1987, abandoned. This application Jan. 31, 1991, Ser. No. 649,371

Claims priority, application Australia, Dec. 3, 1987, PI5724

Int. Cl.[5] B23K *25/00*

U.S. Cl. 219—73.11 **60 Claims**



1. Apparatus for electroslag surfacing of metal plate, the apparatus comprising a plate feeder assembly along which metal plate to be surfaced is conveyed during an electroslag cladding operation, the plate feeder assembly including an elongate, horizontally disposed feeder table having an approach-end section and a runout-end section; and an electroslag surfacing installation operable to clad an upper surface of the metal plate as it is conveyed along the plate feeder table, the surfacing installation being located intermediate said sections; the plate feeder assembly having conveying means, spaced along the feeder table, on which the metal plate is conveyed in a feeding direction from the approach-end section to, and beyond, the surfacing installation so as to discharge from the surfacing installation along the run-out section; the surfacing installation including a flux mould arrangement positioned to contain molten flux during a cladding operation so that a sufficient depth of flux is maintained on said upper surface for efficient electroslag cladding; the surfacing installation further including an electrode holder and feeder assembly which is spaced over the plate feeder assembly, above the mould arrangement, and which extends laterally of the plate feeder assembly relative to said feeding direction; the electrode holder and feeder assembly being adapted to hold electrode means and being connectable to a power source for the supply of electric power to said electrode means for an electroslag operation, the electrode holder and feeder assembly being operable to adjust said electrode means vertically; the apparatus being such that, as metal plate to be surfaced by a cladding

operation is conveyed along the plate feeder assembly in said feeding direction, the electrode holder and feeder assembly is operable:

to lower the electrode means into the mold arrangement to bring a lower end of the electrode means into contact with said upper surface of the metal plate and establish current flow therebetween,

then to raise the electrode means to an operating height to initiate conditions providing an arc between said lower end and upper surface, and

with establishment of a molten slag pool in said mould arrangement which submerges said arc, to retain said lower end of the electrode means at a spacing from the upper surface sufficient to maintain said arc and efficient electroslag operation.

5,068,508

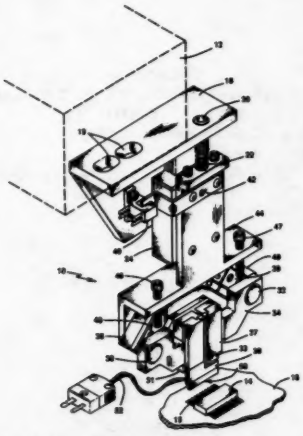
COMPLAINT HOT BAR APPARATUS

Philip A. Phalon, Jr., Sudbury; Marius A. Caramiciu, Dracut, and Robert C. DiGiovanni, Stow, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 1, 1990, Ser. No. 590,734

Int. Cl.[5] B23K *3/03*

U.S. Cl. 219—85.16 **14 Claims**



1. A soldering assembly comprising:

a main member;

means for coupling a support member to said main member, said support member coupling means comprises a sliding means for coupling said support member to said main member, the motion of said sliding means being in a vertical direction; and

soldering means including a hot bar, coupled to said support member, for providing said hot bar to a workpiece, said hot bar having a pivot point about the center of the base of said hot bar when contacting said workpiece.

5,068,509

HIGH FREQUENCY THERMODE DRIVEN DEVICE EMPLOYING ONE-TURN-SECONDARY TRANSFORMERS

Eldred H. Paufve, Windsor, and Richard Porterfield, Binghamton, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Jan. 11, 1990, Ser. No. 463,456

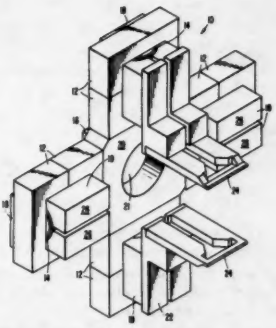
Int. Cl.[5] B23K *3/00*

U.S. Cl. 219—85.16 **6 Claims**

1. A high-frequency device having a plurality of transformers, each transformer having a primary winding driven by a high-voltage source, said device comprising:

a support member, said support member having a plurality of projections extending radially outwardly from a central portion, each of said projections having at least one pair of ears extending therefrom;

a plurality of transformer cores corresponding in number to



the number of said projections, each of said ears protruding through an aperture of said corresponding transformer core outside of the primary winding; and

a plurality of thermodes corresponding in number to the number of said projections, each of said thermodes being electrically coupled to said corresponding projection;

wherein each of said projections acts as a one-turn-secondary winding for a corresponding primary winding.

5,068,510

SOLDERING MEANS WHICH HAS AT LEAST ONE STIRRUP ELECTRODE WHICH CAN BE HEATED BY ELECTRICAL RESISTANCE

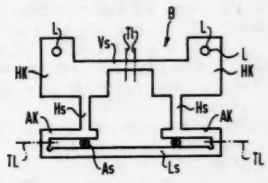
Rudolf Schuster, Heimstetten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1990, Ser. No. 506,922

Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3916353

Int. Cl.[5] B23K *3/03, 35/02*

U.S. Cl. 219—85.16 **10 Claims**



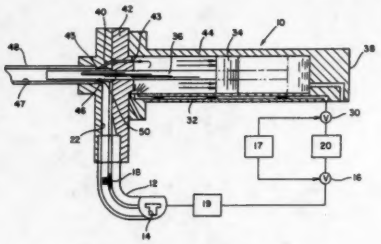
1. A soldering means comprising at least one stirrup electrode which is subject to electrical resistance heating for soldering high-pole electronic components on PC boards, comprising, a soldering strip (Ls) with outer ends of which faces the joint to be soldered, a pair of expansion-compensation guards (AK) attached to the outer ends of said soldering strip (Ls) and extending toward each other, a pair of retaining elements (Hs) attached to the inner ends of said pair of expansion-compensation guards (AK) and extending in a direction normal to the soldering strip (Ls) and spaced relative to each other a distance (A).

5,068,511

STUD WELDING TOOL

Kenneth R. Meyer, Sr., Lake Orion, Mich., assignor to Emhart Industries, Inc., Towson, Md.

Filed Jul. 13, 1990, Ser. No. 553,095
Int. Cl.[5] B23K *9/20*
U.S. Cl. 219—98 **4 Claims**



1. A stud welding tool comprising

a stud receiver having a horizontal through passageway and a vertical passageway extending vertically upwardly from the bottom of said stud receiver and communicating with said horizontal passageway,

a collet secured within one end of said horizontal passageway,

a load tube secured to said receiver to define a cylinder therewith,

an actuator including a piston and a rod displaceable within said cylinder with said rod displaceable from a retracted position at one side of said vertical passageway to an advanced position locating a stud in the end of said collet,

feed tube means for guiding a stud to said vertical passageway,

means for blowing a stud through said feed tube means and said vertical passageway toward said rod when said rod is at said advanced position,

means for terminating said blowing means when said piston is retracted and

exteriorly directed air jet means located downstream of the juncture of said vertical and horizontal passageways for creating a vacuum upstream thereof for drawing a stud located in said vertical passageway or in said feed tube means downstream toward said collet,

said air jet means further comprising means for blowing the stud to the end of said collet when said stud is displaced downstream of said air jet means.

5,068,512

DEVICE FOR PRODUCING AMORPHOUS CERAMIC PRODUCTS OR METAL ALLOYS

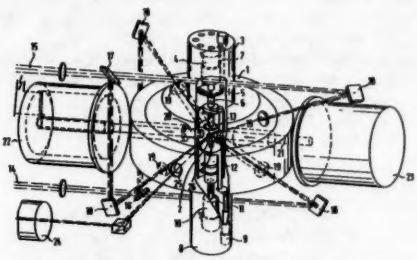
Jacobus Van Geel; Joseph Magill, both of Karlsruhe; Paul Werner, Dettenheim, and Jean-Pol Hiernaut, Linkenheim, all of Fed. Rep. of Germany, assignors to European Atomic Energy Community, Luxembourg

PCT No. PCT/EP89/00360, § 371 Date Sep. 26, 1990, § 102(e) Date Sep. 26, 1990, PCT Pub. No. WO89/09674, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 3, 1989, Ser. No. 573,229
Claims priority, application Luxembourg, Apr. 7, 1988, 87192
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.6 **6 Claims**

1. A device for producing amorphous ceramic products or metal alloys by means of a high pressure autoclave in which firstly a preform of the sample is heated by means of laser beams up to melting temperature and then rapidly cooled down,

below a process position (2), in which the sample is heated up and cooled down, an acousting levitation installation (12) is disposed, which is constituted by a piezoelectrically excited sound source and which levitates the sample in the process position (2) without contacting it, characterized in that

the process position (2) is disposed in the intersection point of at least two laser beams (14, 15), which penetrate into the autoclave via windows (19) in view of heating up the sample,



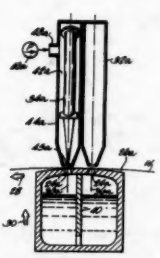
two stamps (20, 21) are disposed facing each other on either side of the process position (2) in the autoclave (1), which are susceptible to be electromagnetically pushed towards each other, in order to crush the sample therebetween and thus rapidly cool it down.

5,068,513

WATER JET SLITTER WITH LASER FINISH AND METHOD

Donald Gangemi, Great Barrington, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 28, 1990, Ser. No. 589,369
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.67 **10 Claims**



1. Apparatus for producing a smooth cut in a traveling fibrous web comprising, in combination:

means for supporting the traveling fibrous web in a relatively taut span;

trough means disposed proximate the web on one side thereof;

water jet means disposed proximate the web on the other side of the web and arranged to direct a web severing water jet against the web over the trough means to thereby produce a pair of spaced, severed edges in the web, each of the edges having fibers protruding therefrom;

laser means disposed proximate the traveling web on the same side thereof as the water jet means to direct a fiber cutting laser beam against the edges of the traveling web severed by the water jet to cut at least the ends of the fibers protruding from the severed edges;

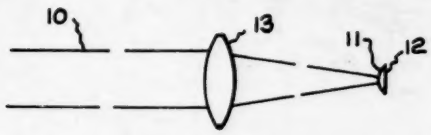
wherein a smooth cut is efficiently produced in the traveling web.

5,068,514

LASER POLISHING OF LENS SURFACE

James G. Lunney, Dublin, Ireland, assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 23, 1989, Ser. No. 424,759
Claims priority, application Ireland, Oct. 25, 1988, 3228/88
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 4 Claims



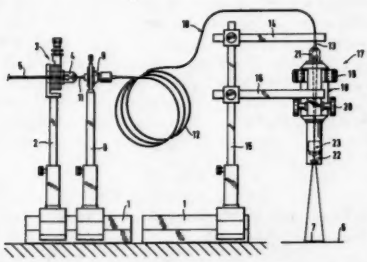
1. A process for smoothing of a lens surface, comprising the step of irradiating the surface of a lens with a laser beam, to cause a controlled level of melting of the lens surfaces, but without substantial ablative photo decomposition, whereby the surface of the lens is smoothed, and, wherein the fluence of the laser beam is less than 0.3 $3JCM^{-2}$ and the number of laser shots is greater than 200.

5,068,515

APPARATUS FOR HOMOGENIZING THE NON-HOMOGENEOUS LIGHT DISTRIBUTION OF A LASER BEAM

Hubert van den Bergh, Goumoens-la-Ville; Peter F. Cornaz, deceased, late of Vevey; Max M. Cornaz, heir, Chesalles; Jean-Pierre Cornaz, heir, Pratteln; Maria I. Cornaz, heir, Berne, and Georges Wagnières, Lutry, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1990, Ser. No. 630,120
Claims priority, application Switzerland, Dec. 27, 1989, 4652/89
Int. Cl.[5] B23K *26/06*
U.S. Cl. 219—121.73 9 Claims



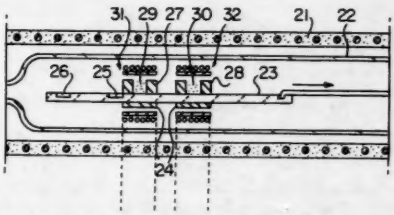
1. Apparatus for homogenising the non-homogeneous light distribution of a laser beam for the sharp-edged irradiation of an area, having a laser beam source, focusing optics for focussing the laser beam, an optical arrangement positioned after said focussing optics having a multimode fibre (10) with an inlet end face and an outlet end face, and magnifying projection optics positioned after said outlet end face, the inlet end face (11) being struck by the laser beam (5) focussed by means of the focussing optics (4) and the outlet end face (13) being imaged onto the area (6, 7) to be irradiated by means of the magnifying projection optics (17).

5,068,516

DEVICE FOR LIQUID-PHASE THIN FILM EPITAXY

Kim Ki-Joon, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea

Division of Ser. No. 157,981, Feb. 19, 1988, Pat. No. 4,918,029.
This application Apr. 16, 1990, Ser. No. 509,300
Claims priority, application Rep. of Korea, Feb. 21, 1987, 1489/1987
Int. Cl.[5] H05B *3/64, 6/10*
U.S. Cl. 219—388 2 Claims



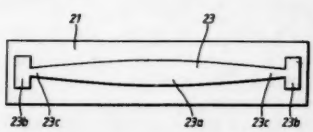
1. A device for liquid-phase epitaxial growth comprising:
a quartz tube;
a plurality of boats in a movable substrate holder for supporting corresponding semiconductor substrates,
a plurality of liquid holders and supporting plates for said liquid holders positioned within said quartz tube,
an electric furnace positioned outside of said quartz tube, and
a plurality of auxiliary heating devices disposed between said tube and said liquid holders and positioned around said liquid holders and boats, said auxiliary heating devices being connectable to power source independently from said electric furnace, whereby each liquid is enabled to be selectively heated or cooled by corresponding ones of said auxiliary heating devices independently of any other liquid within any corresponding other one of said plurality of liquid holders.

5,068,517

PRINTED STRIP HEATER

Takao Tsuyuki; Shigehiro Sato, both of Yokohama, and Tetsuo Ootani, Yokosuka, all of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,700
Claims priority, application Japan, Aug. 25, 1988, 63-211401; Aug. 30, 1988, 63-215734; Nov. 9, 1988, 63-282777; Nov. 22, 1988, 63-295671
Int. Cl.[5] H05B *3/26*
U.S. Cl. 219—543 35 Claims



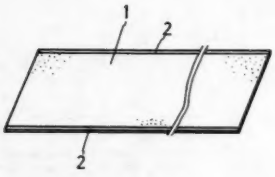
1. A printed strip heater for heating an object comprising:
a heat resistive substrate;
a strip of electrically conductive material mounted on the substrate having a first end and a second end; and
means for providing electrical energy to the strip electrically connected to the first and second ends, wherein a width of the strip is reduced near the means for providing electrical energy.

5,068,518

SELF-TEMPERATURE CONTROL FLEXIBLE PLANE HEATER

Shigeyuki Yasuda, 2-27, Imaike-minami, Chigusaku, Nagoya City, Japan

Filed Dec. 22, 1989, Ser. No. 455,613
Claims priority, application Japan, Dec. 24, 1988, 63-326485
Int. Cl.[5] H05B *3/34*
U.S. Cl. 219—549 2 Claims



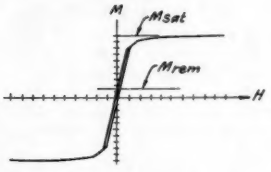
1. A self-temperature control flexible plane heater wherein a mixture of super high polymeric polyethylene glycol whose molecular weight is about 100,000 to 1,000,000 and polyethylene glycol whose molecular weight is about 600–10,000 is dissolvedly mixed with carbon powder, to form a heat-sensitive electrically resistant compound which contains electrodes therein, and such a heat-sensitive electrically resistant compound is enveloped with softened insulator means.

5,068,519

MAGNETIC DOCUMENT VALIDATOR EMPLOYING REMANENCE AND SATURATION MEASUREMENTS

David R. Bryce, Morrisville, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Filed Jan. 10, 1990, Ser. No. 463,316
Int. Cl.[5] G06K *7/08;* G01N *27/72;* G01R *33/12*
U.S. Cl. 235—449 23 Claims



1. Apparatus for determining the genuineness of a document printed at least in part with magnetic ink including in combination

means for applying to a portion of a document printed with magnetic ink a magnetizing force sufficient to saturate the magnetic ink in said portion,

means for measuring the saturation magnetization of said portion while applying said saturating magnetic force to produce a first signal representing the saturation magnetization of said portion,

means for measuring the magnetization of said portion after the removal of a magnetizing force from said portion to produce a second signal representing the remanent magnetization of said portion,

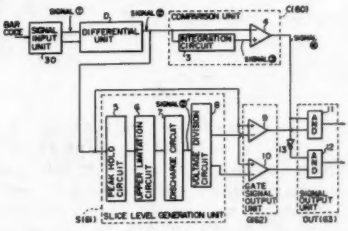
and means for comparing said first and second signals with each other to provide an indication of the genuineness of said document.

5,068,520

SIGNAL PROCESSING CIRCUIT OF A BAR CODE READER

Shinichi Sato, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1990, Ser. No. 585,624
Claims priority, application Japan, Sep. 22, 1989, 1-247784
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—462 5 Claims



1. A signal processing circuit of a bar code reader, comprising:

signal input means for optically detecting a bar code provided on a surface of goods and outputting a first signal after optical-to-electrical conversion;

differential means, connected to said signal input means, for amplifying the first signal, differentiating the first signal, filtering the first signal after differentiation to eliminate a high frequency noise, and outputting a second signal after filtering;

comparison means, connected to said differential means, for integrating the second signal and outputting a third signal after integration, and comparing the second signal with the third signal and outputting a fourth signal when the third signal is larger than the second signal;

slice level generation means, connected to said differential means, for holding a peak voltage of the second signal, suppressing the peak voltage to a predetermined upper limitation voltage, discharging the suppressed peak voltage in accordance with a predetermined time constant, and dividing the suppressed peak voltage into a predetermined voltage rate to obtain a positive slice voltage and a negative slice voltage;

gate signal output means, connected to said differential means and said slice level generation means, for comparing the second signal with the positive slice voltage and the negative slice voltage; and

signal output means, connected to said comparison means and said gate signal output means, for inputting the fourth signal and the positive slice voltage, inputting the inverted fourth signal and the negative slice voltage, and outputting a gate signal to obtain a binary-coded signal.

5,068,521

NON-CONTACT IC CARD

Atsuo Yamaguchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

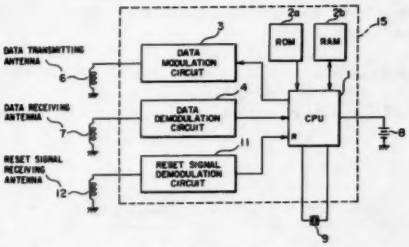
Filed Aug. 16, 1989, Ser. No. 394,479
Claims priority, application Japan, May 18, 1989, 1-122787
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—492 9 Claims

1. A non-contact IC card comprising:

data transmission/reception means for data transmission and data reception between an IC card and an external device via an electromagnetic carrier wave having a first frequency, without direct contact between the IC card and external device;

data processing means connected to said data transmission/reception means for processing data received from the external device;

reset signal detecting means for detecting an electromagnetic wave having a second frrequency diffeent fromthe first frequency trasmited as a reset signal from the external device o the IC card without direct contct between the IC card and external device; and



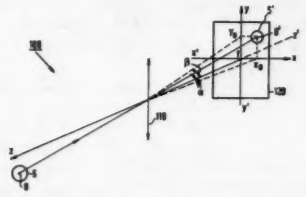
initializing means for initializin said data processing means in responset o the detection of a reset dignal by said reset signal detecting means.

5,068,522

ARRANGEMENT FOR DETERMINING THE DIRECTION OF THE ENERGY CENTER OF A LUMINOUS OBJECT

Benoit Falp, Versailles, and Christian Pezant, Villecresnes, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Feb. 26, 1990, Ser. No. 485,208
Claims priority, application France, Feb. 24, 1989, 89 02400
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—206.1 **2 Claims**



1. Apparatus for determining the direction of the energy center of a luminous object, comprising:

a photo-sensitive charge transfer matrix detector without a memory including N_l lines and N_c columns and an output register having N_c elements;

lens means for forming an image of the luminous object on the detector;

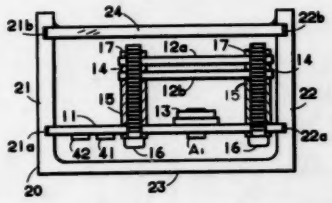
locating means coupled to the detector for determining the position of the energy center of the object by barycentric calculation within a window surrounding the image and covering $p_l \times P_c$ elements of the matrix, the locating means having a search mode for reading the matrix into the output register in groups of m lines wherein $m < P_l$ and reading the output register in groups of l consecutive elements where $l < P_c$ to determine the brightest $m \times l$ area of the matrix for determining the approximate position of the image, and a measuring mode for reading the matrix into the output register in groups of n lines where $n > P_l$ outside the approximate position of the image and reading k lines of the matrix containing the window where $k > P_l$ into the output register line by line around the approximate position of the image.

5,068,523

SCANNER DETECTOR ARRAY AND LIGHT DIFFUSER

Alexander Adelson, Peekskill, N.Y., assignor to Intec Corp., Trumbull, Conn.

Filed Mar. 2, 1990, Ser. No. 487,571
Int. Cl.[5] H01J *40/14*; G01N *21/88*
U.S. Cl. 250—208.1 **7 Claims**



1. A detector comprising: an array of detector elements disposed in at least one row and in a plurality of columns, wherein each detector element comprises a lens receptive of light on one face thereof along a light path from a target and outputting light at the other face, a photodetector for generating an electrical signal in response to light received thereon, for receiving the signal generated by the photodetector, wherein the array of detector elements comprises at least one detector module having means mounting a plurality of lenses side-by-side, a common substrate on which the photodetectors and preamplifiers for all of the lenses in the module are mounted with each preamplifier adjacent to a corresponding photodetector, means mounting the common substrate in the at least one detector module comprising a U-shaped frame having a light transparent window at an open side thereof and slots for slidably receiving the common substrate parallel to the window and means connecting the plurality of side-by-side mounted lenses to the common substrate to dispose each photodetector at a fixed distance form the other face of a corresponding lens and facing the other face to receive light passing through the lens.

5,068,524

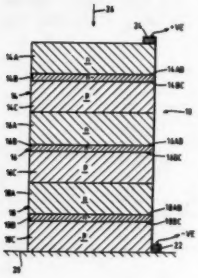
MULTIPLE HETEROSTRUCTURE PHOTODETECTOR

Charles T. Elliott, and Anthony M. White, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB89/01406, § 371 Date Aug. 23, 1990, § 102(e) Date Aug. 23, 1990, PCT Pub. No. WO90/06597, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 24, 1989, Ser. No. 571,587
Claims priority, application United Kingdom, Dec. 5, 1988, 8828348
Int. Cl.[5] H01J *40/14, 27/14*; G01J *5/20*
U.S. Cl. 250—211 J **5 Claims**

1. A photodetector comprising a semiconductor multilayer structure (10) characterized in that the structure (10) has a plurality of successively disposed sections (14, 16, 18) each having three respective layers (e.g. 14A, 14B, 14C), the three layers consisting of a relatively narrow bandgap residual n-type central layer (14B) sandwiched between relatively wide bandgap outer layers (14A, 14C) doped n-type and p-type respectively, the central layer (14B) being sufficiently thin to exhibit minority carrier extraction throughout its thickness when biased and having sufficiently low doping to exhibit intrinsic conductivity at an operating temperature when unbi-

ased, and the outer regions (14A, 14C) being sufficiently thick to inhibit minority carrier injection into the central region



(14B) and having sufficiently high doping to provide extrinsic conductivity at the operating temperature.

5,068,525

APPARATUS FOR MEASURING THE DURATION OF SINGLE OPTICAL RADIATION PULSES

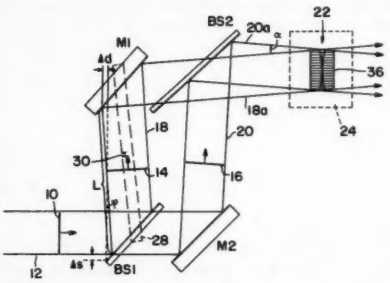
Fritz P. Schaefer; Sandor Szatmari, and Jaydev Jethwa, all of Goettingen, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften, e.V., Fed. Rep. of Germany

Filed Aug. 13, 1990, Ser. No. 566,678

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1989, 3926945

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—213 VT **15 Claims**



1. An apparatus for measuring the duration of single, short optical radiation pulses, particularly laser radiation pulses by means of an autocorrelator based on multiphoton ionization comprising:

beam splitter means (BS1, BS2, M1, M2) for generating from an input light radiation pulse two coherent component pulses (14, 16) which propogate along two component beam paths (18,20) each containing a section (18*a*, 20*a*) passing through a measuring zone (22),

a photoionization detector (36) containing said measuring zone comprising collector electrode means (36) and counter-electrode means (38) at which an electric output signal is available, depending on the number of charge carriers generated in the measuring zone, and

a measuring system (42, 50, 52, 62) connected to said electrode means (36, 38)

characterized in that said collector electrode means (36) contains a number of strip-type collector electrodes in parallel, electrically separated from each other, located in a plane which is essentially parallel to the two component beam path sections (18*a*,20*a*) in said measuring zone (22) and oriented in the longitudinal direction essentially in the direction of the component beam cavity sections (18*a*, 22*a*) passing through said measuring zone (22).

5,068,526

PHOTOELECTRIC CONVERSION DEVICE WITH VOLTAGE SOURCE MEANS

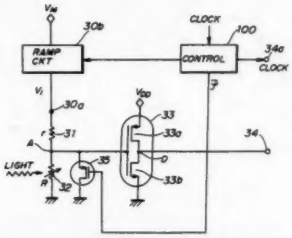
Akihiko Hiroe, Fujisawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 12, 1990, Ser. No. 580,966

Claims priority, application Japan, Sep. 13, 1989, 1-238870

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214 R **9 Claims**



1. A photoelectric conversion device supplied with an optical radiation for producing an electric signal corresponding to the optical radiation, comprising:

first voltage source means for providing a first predetermined voltage;

a photoconductive cell having a first end connected to the first voltage source and a second end, said photoconductive cell being provided so as to receive an optical radiation and having a resistance that is changed in response to the optical radiation supplied thereto;

a load resistance having a first end connected to the second end of the photoconductive cell and a second end;

second voltage source means connected to the second end of the load resistance for providing thereto a second predetermined voltage that is different from the first predetermined voltage; and

threshold detection means having an input terminal connected to the second end of the photoconductive cell, said threshold detection means having a threshold level and producing a first output signal having a first level when an input signal supplied to the input terminal has a level below the threshold level while producing a second output signal having a second level when the input signal has a level above the threshold level.

5,068,527

WIDE RANGE FIBER OPTICAL DISPLACEMENT SENSOR

Katsuharu Iwamoto; Osamu Kawakami, and Hideo Miyagawa, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 399,113, Aug. 28, 1989, Pat. No. 4,996,418, which is a continuation-in-part of Ser. No. 127,983, Dec. 3, 1987, abandoned. This application Aug. 28, 1990, Ser. No. 573,561

Claims priority, application Japan, Jan. 7, 1987, 62-000501; Aug. 23, 1988, 63-207423; Dec. 27, 1988, 63-327901

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.21 **13 Claims**

1. A fiber optical displacement sensor for measuring displacement of a surface to be measured, comprising:

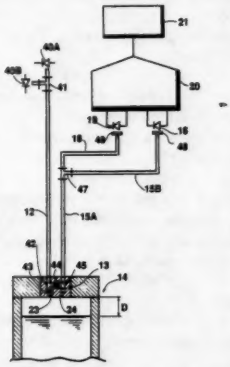
light source means for continuously providing a projection beam to be projected onto the surface to be measured having a certain wavelength and a reference beam which carries no information related to the displacement to be

measured having another wavelength different from that of the projection beam;

projecting optical fiber for transmitting the projection beam to a vicinity of the surface to be measured and the reference beam;

first photo coupler means between the light source means and the projecting optical fiber for combining the projection beam and the reference beam;

receiving optical fiber for transmitting a reflected beam resulting from reflection of the projection beam by the surface to be measured which carries information related to the displacement to be measured and the reference beam;



first filter means for separating out the reference beam transmitting through the projecting optical fibers from the projection beam;

second photo coupler means between the first filter means and receiving optical fiber for combining the the reference beam separated by the first filter means and the reflected beam;

second filter means for separating out the reference beam transmitting through the receiving optical fiber from the reflected beam;

beam conversion means for converting the reflected beam and the reference beam into corresponding electrical signals; and

means for deriving the displacement to be measured in accordance with the corresponding electrical signals.

5,068,528

ENCODED SURFACE POSITION SENSOR WITH MULTIPLE WAVELENGTHS AND REFERENCE BEAM

Glen E. Miller, Redondo, and Rudy L. Prater, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 28, 1990, Ser. No. 574,203

Int. Cl.[5] G01D 5/34

U.S. Cl. 250—231.13 **23 Claims**

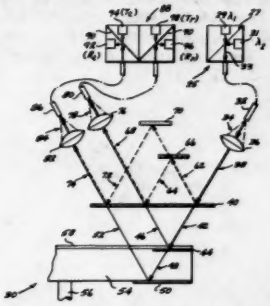
1. A position sensor, which derives position data in respect to an encoded surface having a characteristic light transmissivity that varies as a function of the position of the encoded surface, said position sensor comprising:

a. light source means for producing light at two substantially different wavelengths of predefined relative intensity to each other, including a reference beam having a reference wavelength and a test beam having a test wavelength, said reference and test beams initially traveling along a common optical path within the position sensor toward the encoded surface;

b. means for separating the reference beam from the test beam so that the reference beam is deflected away from the encoded surface along a reference optical path;

c. splitting means for splitting the reference beam traveling along the reference optical path between a first and a second optical path; and

d. a first mirror disposed adjacent an opposite side of the encoded surface from the side on which the test beam is incident, said first mirror reflecting a portion of the test beam that is transmitted through the encoded surface along the first optical path, another portion of the test beam being reflected from the encoded surface and travel-



ing along the second optical path, whereby variations in the transmissivity of the encoded surface modulate the relative intensities of the transmitted and reflected portions of the test beam respectively propagating along the first and the second optical paths, thus defining the position of the encoded surface when compensated for light losses in the optical paths as a function of the intensities of light at the reference wavelength propagating along the first and the second optical paths.

5,068,529

ABSOLUTE POSITION DETECTION ENCODER

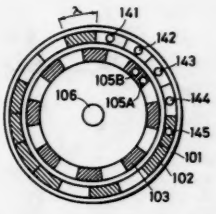
Kou Ohno; Tetsuo Hattori, both of Kanagawa, and Tsuyoshi Matsumoto, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 453,986

Claims priority, application Japan, Dec. 22, 1988, 63-322189; Dec. 28, 1988, 63-328873; Jan. 30, 1989, 1-17489

Int. Cl.[5] G01D 5/34

U.S. Cl. 250—231.18 **13 Claims**



1. An absolute position detection encoder comprising:

coder means provided with track means in which an absolute pattern having code contents of a plurality of bits is realized by series type first graduations;

detector means relatively movable with respect to said coder means and adapted to read out said first graduations to produce a plurality of detection pulse trains having a phase difference corresponding to a length which is an integer multiple of a minimum reading unit of said first graduations; and

signal processing means for processing said detection pulse trains obtained upon reading said first graduations by said detector means with clock signals synchronized at time points corresponding substantially to an intermediate

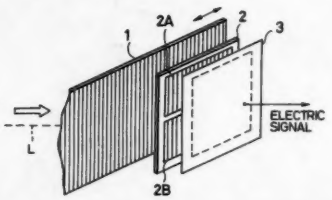
position of the minimum reading unit of said first graduations to produce parallel output signals of signal code contents corresponding to the absolute position of said detector means relative to said coder means.

5,068,530

OPTICAL ENCODER

Atsushi Ieki, and Keiji Matsui, both of Aichi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Jul. 13, 1990, Ser. No. 552,929
Claims priority, application Japan, Jul. 17, 1989, 1-183871
Int. Cl.[5] H01J *3/14, 5/16, 40/14*
U.S. Cl. 250—237 G **7 Claims**



1. An optical encoder including a first diffraction grating and a second diffraction grating which is displaceable relative to said first diffraction grating, said encoder being capable of detecting said relative displacement.

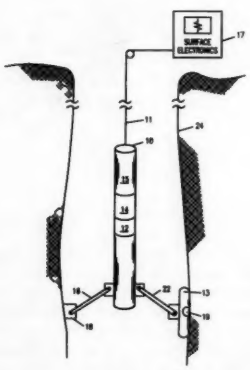
the improvement being characterized in that said second diffraction grating has a grating pattern which removes a component having a period which is a factor of 1/n (n: a positive odd number) of the period of a displacement signal representing said relative displacement.

5,068,531

METHOD AND APPARATUS FOR PRODUCING A POROSITY LOG OF A SUBSURFACE FORMATION CORRECTED FOR DETECTOR STANDOFF

L. Scott Allen, Dallas; William R. Mills, Plano, and Daivd C. Stromswold, Addison, all of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 4, 1991, Ser. No. 680,711
Int. Cl.[5] G01V *5/10*
U.S. Cl. 250—269 **10 Claims**



1. A method for converting signals representing the die-away of nuclear radiation in a subsurface formation surrounding a borehole into a log representing porosity versus depth within said subsurface formation corrected for the effect of detector standoff from the borehole wall,

a) lowering a logging tool having a neutron source and a neutron detector into said borehole,

b) irradiating said subsurface formation with neutrons from said neutron source as said logging tool is traversed along said subsurface formation,

c) recording die-away signals representing the die-away of nuclear radiation in said subsurface formation as detected by said neutron detector,

d) producing intensity signals representing the variations in intensity of said die-away signals,

e) producing a model of the die-away of nuclear radiation in said subsurface formation having terms varying exponentially in response to borehole, formation and background effects on the die-away of nuclear radiation as detected by said detector,

f) producing weighted moments of said model and of said intensity signals,

g) producing a ratio of the borehole amplitude to formation amplitude components of said intensity signals derived from said weighted moments,

h) producing an initial formation decay constant signal from formation and thermal neutron background terms of said model and said intensity signals,

i) producing a standoff corrected formation decay constant signal in accordance with a function of said ratio and said initial formation decay constant signal derived from die-away signals recorded in borehole models at known porosities and conditions of detector standoff from the borehole wall, and

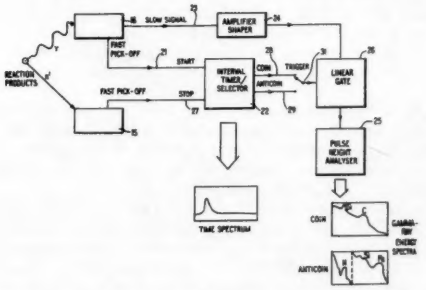
j) producing a log of porosity versus depth within said subsurface formation corrected for detector standoff from the borehole wall as a function of said standoff corrected formation decay constant signal derived from calibrated measurements in borehole models at known porosities and conditions of detector standoff from the borehole wall.

5,068,532

ANALYSIS USING NEUTRONS

Malcolm R. Wormald, Abingdon, and Bruce W. Thomas, Wantage, both of United Kingdom, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 268,285, Nov. 7, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 496,139
Claims priority, application United Kingdom, Nov. 12, 1987, 8726477
Int. Cl.[5] G01V *5/00*
U.S. Cl. 250—270 **14 Claims**



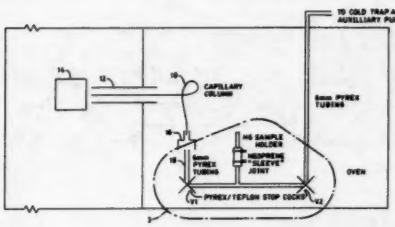
1. A method for analysis of material comprising irradiating the material with neutrons, detecting resultant gamma rays, detecting fast neutrons scattered from the material, and registering the number of gamma detection events at at least one selected energy which occur in coincidence or anticoincidence with detection of a scattered neutron.

5,068,533

MANIFOLD AND METHOD OF BATCH MEASUREMENT OF HG-196 CONCENTRATION USING A MASS SPECTROMETER

Mark W. Grossman, Belmont, Mass., and Roger Evans, N. Hampton, N.H., assignors to GTE Products Corporation, Danvers, Mass.

Filed Mar. 15, 1989, Ser. No. 323,737
Int. Cl.[5] H01J 49/04
U.S. Cl. 250—288 3 Claims



1. The method of analyzing mercury vapor in a mass spectrometer using a sample manifold for use in introducing small samples of mercury vapor into a mass spectrometer for analysis thereof, said manifold comprising in combination:

(a) a capillary member in communication at one end thereof with the ion source of a mass spectrometer and a gas/-vacuum inlet/outlet member at the other end thereof;

(b) said gas/vacuum inlet-outlet member comprising valve means for the vacuum purging of both the member and gaseous pressurization thereof, said member further being connected to a vacuum means and said pressurization means; and

(c) a removable mercury sample holder connected to the inlet/outlet member, said method comprising the sequential steps of:

(a) measuring the effluent content by conducting the following sequence of steps:

i. performing a feedstock scan;

ii. purge;

iii. performing an effluent scan; and

iv. purge;

v. performing a feedstock scan; and

(b) measuring the mercury content in the gaseous system by conducting the following sequence of steps:

i. performing a feedstock scan;

ii. purge;

iii. performing a mercury scan; and

iv. purge.

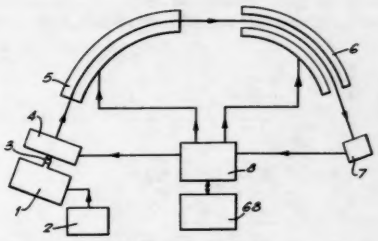
5,068,534

HIGH RESOLUTION PLASMA MASS SPECTROMETER

Neil Bradshaw, Stockport, and Neil E. Sanderson, Sandiway, both of United Kingdom, assignors to VG Instruments Group Limited, Haywards Heath, United Kingdom

PCT No. PCT/GB89/00622, § 371 Date Dec. 3, 1990, § 102(e) Date Dec. 3, 1990, PCT Pub. No. WO89/12313, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 5, 1989, Ser. No. 623,401
Claims priority, application United Kingdom, Jun. 3, 1988, 8813149
Int. Cl.[5] B01D 59/44; H01J 49/00
U.S. Cl. 250—288 17 Claims

1. A mass spectrometer for the analysis of a sample comprising means for establishing a plasma discharge in an inert gas by means of an electrical field energized by a radio-frequency or microwave generator; means for introducing said sample into said plasma discharge; a sampling cone disposed adjacent to said plasma and having an aperture in its apex; a mass analyzer disposed to receive at least some of the ions generated in said plasma which pass through said aperture; and means for maintaining the pressure on the side of said sampling cone remote from said plasma substantially below atmospheric pressure, characterized in that said mass analyzer comprises at least a magnetic sector analyzer having an entrance slit, and including



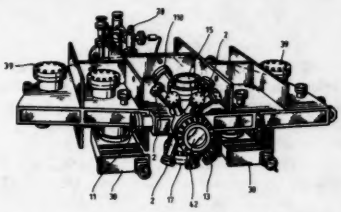
means for maintaining a potential difference between said sampling cone and said entrance slit of such a magnitude that the energy of the ions after they have passed through said entrance slit permits their mass analysis by said magnetic sector analyzer.

5,068,535

TIME-OF-FLIGHT ION-SCATTERING SPECTROMETER FOR SCATTERING AND RECOILING FOR ELECTRON DENSITY AND STRUCTURE

J. Wayne Rabalais, Houston, Tex., assignor to University of Houston - University Park, Houston, Tex.

Continuation of Ser. No. 164,530, Mar. 7, 1988, abandoned. This application Mar. 3, 1989, Ser. No. 320,213
Int. Cl.[5] H01J 37/252, 49/44
U.S. Cl. 250—309 41 Claims



1. A time-of-flight ion-scattering spectrometer comprising:

an ultra-high vacuum chamber; and

at least one tube having a first end portion and a second end portion, said first end portion being coupled to said vacuum chamber and said second end portion extending outwardly from said vacuum chamber, said second end portion being adapted to house a time-of-flight detector.

5,068,536

METHOD FOR PROVIDING CUSTOM CALIBRATION FOR NEAR INFRARED INSTRUMENTS FOR MEASUREMENT OF BLOOD GLUCOSE

Robert D. Rosenthal, Gaithersburg, Md., assignor to Futrex, Inc., Gaithersburg, Md.

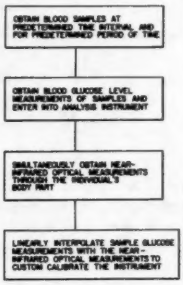
Continuation-in-part of Ser. No. 565,302, Aug. 10, 1990, which is a continuation-in-part of Ser. No. 544,580, Jun. 27, 1990, which is a continuation-in-part of Ser. No. 298,904, Jan. 19, 1989, Pat. No. 5,028,787. This application Apr. 9, 1991, Ser. No. 682,249
Int. Cl.[5] G01N 21/59
U.S. Cl. 250—341 11 Claims

1. A method for calibrating a near-infrared analysis instrument for the measurement of blood glucose, said method comprising:

(a) obtaining a plurality of blood samples from an individual

each at a first predetermined time interval during a predetermined period of time and obtaining a blood glucose level measurement for each said blood sample;

(b) obtaining near-infrared optical absorption measurements through a body part of said individual at a second predetermined time interval and during said predetermined period of time, and recording said measurements; and


OBTAIN BLOOD SAMPLES AT PREDETERMINED TIME INTERVAL AND FOR PREDETERMINED PERIOD OF TIME
OBTAIN BLOOD GLUCOSE LEVEL MEASUREMENTS OF SAMPLES AND ENTER INTO ANALYSIS INSTRUMENT
SIMULTANEOUSLY OBTAIN NEAR-INFRARED OPTICAL MEASUREMENTS THROUGH THE INDIVIDUAL'S BODY PART
LINEARLY INTERPOLATE SAMPLE GLUCOSE MEASUREMENTS WITH THE NEAR-INFRARED OPTICAL MEASUREMENTS TO CUSTOM CALIBRATE THE INSTRUMENT

(c) performing calibration regression analysis utilizing means for linearly interpolating said blood sample glucose level measurements with said near-infrared optical absorption measurements to calibrate said near-infrared analysis instrument for said individual.

5,068,537

PASSENGER NUMBER SENSOR SYSTEM

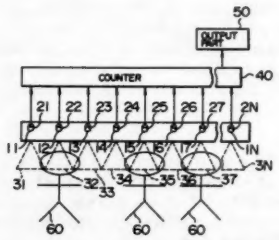
Haruo Ishikawa, Kawasaki; Kiyoshi Kawana, Tokyo; Ko Honma, Yokohama, and Takashi Yoshikawa, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 14, 1991, Ser. No. 669,374

Claims priority, application Japan, Mar. 19, 1990, 2-068811

Int. Cl.[5] G01V *9/04*; G08B *13/18*

U.S. Cl. 250—342 **1 Claim**



1. A passenger-number sensor system comprising:

a plurality of infrared ray sensors disposed on a straight line for detecting temperature changes in their light reception zones;

a plurality of optical lenses disposed one for each of said plurality of infrared ray sensors for determining said light reception zones of the infrared ray sensors; and

means for selecting one of the addition values 1 to n according to a sense pattern based on the temperature changes of the infrared ray sensors.

5,068,538

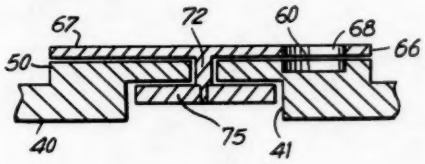
RADON MONITOR WITH SEALABLE DETECTING CHAMBER

Naomi H. Harley, Hoboken, N.J., assignor to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 521,178, May 9, 1990. This application Mar. 6, 1991, Ser. No. 666,889

Int. Cl.[5] G01T *1/02, 1/11*

U.S. Cl. 250—472.1 **18 Claims**



1. A radiation monitor comprising:

an electrically conductive housing having walls defining an internal volume of space;

at least one hole through a wall of the housing for permitting entry of ambient air into the thermal volume of space;

at least one solid state nuclear track detector disposed within the housing;

a barrier within the housing; and means for moving the barrier from outside the housing between a first position in which the at least one solid state nuclear track detector is substantially isolated from alpha radiation in the internal volume of space and a second position in which the at least one solid state nuclear track detector is exposed to alpha radiation in the internal volume of space,

wherein there is substantially no electrical charge present on any portion of the personal radiation monitor.

5,068,539

ION IMPLANTATION APPARATUS

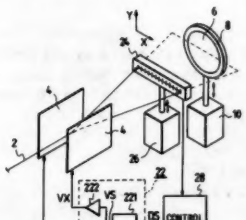
Mamoru Nogami, and Kazuhiro Nishikawa, both of Kyoto, Japan, assignors to Nissin Electric Company, Limited, Kyoto, Japan

Filed May 14, 1990, Ser. No. 522,788

Claims priority, application Japan, May 15, 1989, 1-122450; Jun. 1, 1989, 1-140912

Int. Cl.[5] H01J *37/317*

U.S. Cl. 250—492.2 **3 Claims**



1. An ion implantation apparatus, comprising:

a pair of scanning electrodes for electrostatically scanning an ion beam in an X direction;

a drive unit for mechanically scanning a target in a Y direction substantially perpendicular to the X direction;

a scanning power supply including a signal generator for generating a signal with a waveform according to waveform input data, and an amplifier for amplifying the signal

and for outputting said amplified signal to said pair of scanning electrodes;

a multiple point monitor containing a large number of Faraday cups with the same area disposed in the X direction for receiving the ion beam and for measuring beam current;

a monitor drive unit for moving said multiple point monitor to and from a radiation area of the scanned ion beam; and

a control unit for obtaining the distribution of a beam current sum being entered into each of said Faraday cups according to the beam current measured by each of said Faraday cups of said multiple point monitor, for generating said waveform data so that the distribution of the beam current sum becomes flat, and for inputting the resultant data to the signal generator of said scanning power supply;

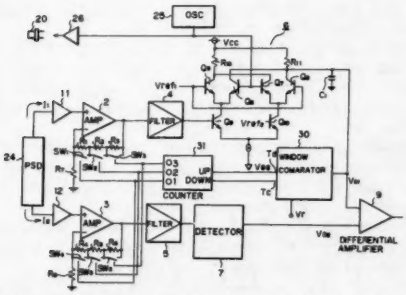
wherein said drive unit comprises an arm for supporting a holder for holding said target, and a reversibly rotatable motor for rotating said arm so that said target is scanned in an arc form while said target faces to said ion beam.

5,068,540

DISTANCE MEASURING APPARATUS HAVING AUTOMATIC GAIN CONTROL

Takahiro Tsuji, Osaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,327
Claims priority, application Japan, Aug. 4, 1989, 1-203437
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **8 Claims**



1. A distance measuring apparatus comprising a light emitting device for emitting infrared light blinking at a constant frequency toward an object, a light receiving device for receiving infrared light reflected from the object, the light receiving device being adapted to generated two output signals which correspond respectively to positive and negative amounts of deviation of a position of light received therein with respect to a center thereof, a pair of amplifiers for amplifying the output signals of the light receiving device, respectively, means for picking up signal components, each having a frequency corresponding of the blink frequency of the infrared light, from the output signals of the amplifiers, respectively, means for determining a distance to the object of the basis of the signal components picked up by the picking up means, and means or controlling a gain of each of the amplifiers, the controlling means including:

a pair of resistor circuits each having a changeable resistance for determining the gain of corresponding one of the amplifiers;

a comparator which compares in magnitude one of the signal components with a reference voltage and generates control signal having modes which change with the difference in magnitude between one of the signal components and the reference voltage; and

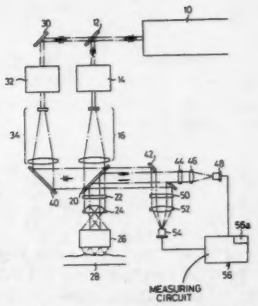
means or changing the resistance of each of the resistor circuits in accordance with the modes of the control signals of the comparator.

5,068,541

SURFACE ROUGHNESS MEASURING METHOD AND APPARATUS UTILIZING TRUNCATED CONICAL LENS AND OBJECTIVE LENS

Michio Kondo, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 15, 1990, Ser. No. 567,741
Claims priority, application Japan, Aug. 23, 1989, 1-216273
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—571 **11 Claims**



1. A method of measuring a roughness of a surface of a subject, comprising the steps of:

disposing a truncated conical lens and an objective lens in series with each other along an optical path, said truncated conical lens having a central circular flat surface and a conical surface which extends from a periphery of said central circular flat surface;

generating and directing parallel rays of light such that the parallel rays of light are transmitted through said truncated conical lens and said objective lens and are thereby converted into a first measuring beam which irradiates a minute spot on said surface of the subject, and a second measuring beam which irradiates an annular spot which surrounds said minute spot;

generating a reference beam having a frequency different from that of said first and second measuring beams, and directing said reference beam such that said reference beam interferes with each of said first and second measuring beams reflected by said surface of the subject, so as to produce two beat beams;

converting said two beat beams into respective two electrical beat signals; and

determining a height variation of said surface of said subject, based on a phase difference between said two electrical beat signals.

5,068,542

METHOD AND APPARATUS FOR CONCENTRATION MEASUREMENT BY THE QUANTITY, DIAMETER AND CONVERGENT OF A TRANSMITTED LIGHT BEAM

Minato Ando; Takashi Kato; Hideyasu Aoki; Yasuyuki Mizushima; Tsunetoshi Okura, and Akemi Kurokawa, all of Nagoya, Japan, assignors to NGK Spark Plug Company, Ltd., Aichi, Japan

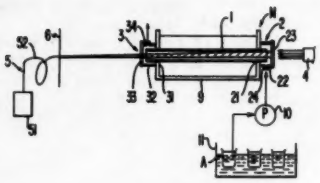
Filed Jun. 19, 1990, Ser. No. 540,606
Claims priority, application Japan, Jun. 22, 1989, 1-160104
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—573 **21 Claims**

1. A method for measuring the concentration of an objective solvent in a mixed solution, comprising the steps of:

flowing a mixed solution through a tube having a first end and second a end;

transmitting a light beam through the first end of the tube, through the mixed solution therein, and out of the second end of said tube;

detecting the quantity of light received at the second end of the tube; and



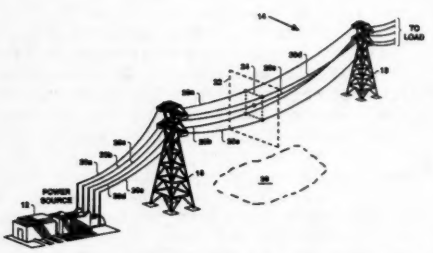
determining the concentration of the objective solvent in the mixed solution on a basis that the quantity of light received is dependent on the concentration of the objective solvent in the mixed solution.

5,068,543

LOW HAZARD EXTREMELY LOW FREQUENCY POWER TRANSMISSION LINE

Tihiro Ohkawa, La Jolla, Calif., assignor to General Atomics, San Diego, Calif.

Filed Nov. 14, 1990, Ser. No. 613,152
Int. Cl.[5] H02G *7/20*
U.S. Cl. 307—91 **11 Claims**



1. A power line distribution system for continuously distributing high voltage electrical power over long distances from a power source to a desired load comprising:

(a) at least three power line conductors, said conductors being connected to appropriate terminals of said power source and said load such that each of said power line conductors carries an electrical current to or from said load as the high voltage electrical power is delivered to said load;

(b) spatial positioning means for maintaining a prescribed spatial relationship between said at least three power line conductors, said spatial positioning means including a plurality of spaced-apart towers at regular intervals for supporting said power line conductors above the ground in said prescribed spatial relationship;

(c) said prescribed spatial relationship causing electromagnetic fields generated around a first group of said at least three power line conductors as sensed in a region of interest below said power line conductors to oppose electromagnetic fields generated around a second group of said at least three power line conductors as sensed in said region of interest, the magnitude of a net electromagnetic field as sensed in said region of interest thereby being reduced;

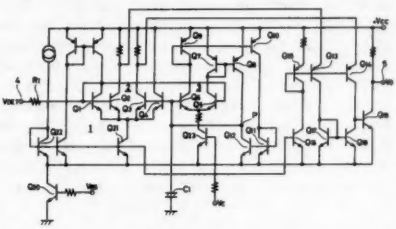
(d) whereby the effects associated with electromagnetic radiation generated around said power line conductors in the region of interest are minimized.

5,068,544

FSK DATA WAVEFORM SHAPING CIRCUIT

Kazuhisa Ishiguro, and Yutaka Sekiguchi, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 16, 1990, Ser. No. 552,732
Claims priority, application Japan, Jul. 18, 1989, 1-185587
Int. Cl.[5] H04L *27/14*
U.S. Cl. 307—268 **2 Claims**



1. A FSK data waveform shaping circuit for waveform-shaping FM detected FSK data and outputting the waveform-shaped FSK data, comprising:

a first differential amplifier circuit including first and second transistors, said first transistor having a base and a collector short-circuited to each other,

a second differential amplifier circuit including third and fourth transistors, said third transistor having a base and an emitter respectively connected to the base and an emitter of said first transistor and said fourth transistor having a base and an emitter respectively connected to a base and an emitter of said second transistor,

a third differential amplifier circuit including fifth and sixth transistors, said fifth transistor having a base connected to the base of said first transistor and said sixth transistor having a base connected to the base of said second transistor, and

capacitance means connected to the base of said second transistor and charged/discharged in accordance with an output signal of said third differential amplifier circuit,

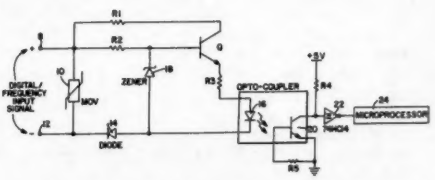
base of said first transistor receiving the FSK data to be waveform-shaped and a waveform-shaped output signal being generated at least at one of collectors of said third and fourth transistors.

5,068,545

DIGITAL/FREQUENCY INPUT FOR INDUSTRIAL CONTROL APPLICATIONS

Richard J. Molnar, Willoughby, Ohio, assignor to Elsag International B.V., Amsterdam, Netherlands

Filed Apr. 20, 1989, Ser. No. 340,984
Int. Cl.[5] H03K *3/42, 5/00, 5/08;* H01S *3/00*
U.S. Cl. 307—311 **7 Claims**



1. A circuit for conditioning a control signal having a variety of waveforms and voltage levels, comprising:

a pair of input terminals for receiving the control signal;

a varistor connected across said terminals for limiting a high transient voltage across said terminals;

a diode connected to one of said terminals for preventing a flow of reverse current to said one terminal;

a transistor having a base connected thru a first resistor to

the other one of said terminals, said transistor having an emitter and a collector; and

opto-coupler means connected to the transistor emitter thru a second resistor for receiving current therefrom, said opto-coupler means having an isolated output for outputting the conditioned control signal, and a third resistor connected at one end thereof to the input terminal connected to said first resistor and at the other end thereof to said collector.

5,068,546

SOLID STATE LASER OPERATING WITH FREQUENCY DOUBLING AND STABILIZED BY AN EXTERNAL RESONATOR

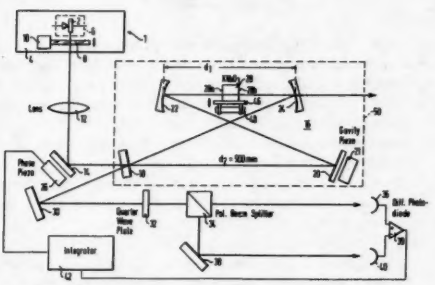
Andreas Hemmerich, Munich, Fed. Rep. of Germany; David McIntyre, Corvallis, Oreg.; Claus Zimmermann, and Theodor Haensch, both of Munich, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 573,536

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008349

Int. Cl.[5] H01S *3/10*

U.S. Cl. 359—328 **16 Claims**



1. A solid state laser comprising

a solid state laser diode for generating fundamental wave laser radiation,

an external ring resonator which is arranged in the beam path of the fundamental wave laser radiation and through which the fundamental wave laser radiation passes in a predetermined forward direction,

an optical nonlinear medium arranged in the ring resonator for generating the 2nd harmonic of the fundamental wave laser radiation and

means for feeding fundamental wave laser radiation back to the solid state laser diode,

said means comprising optical means causing a small part of the fundamental wave laser radiation to propagate in a direction opposite to the forward direction through at least a part of the beam path of said ring resonator back to the solid state laser diode.

5,068,547

PROCESS MONITOR CIRCUIT

William H. Gascoyne, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 5, 1990, Ser. No. 577,945

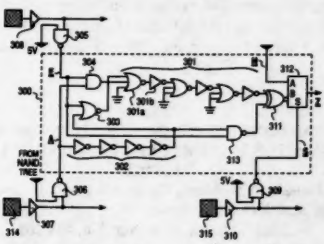
Int. Cl.[5] H03K *5/13, 5/159*

U.S. Cl. 307—443 **14 Claims**

1. A process monitor circuit, comprising:

a first delay path comprising a plurality of logic gates having an input terminal and a first output terminal, said first delay path providing after a first delay a first logic state transition at said first output terminal, when a first input logic state transition is received at said input terminal, and providing after a second delay a second logic state transition at said first output terminal, when a second input logic state transition opposite said first input logic state transition is received at said input terminal, said first and second delays being distinguishably different;

a second delay path having a second output terminal and connected to said input terminal, said second delay path providing after a third delay a third logic state transition at said second output terminal, when said first input logic state transition is received at said input terminal, and providing after a fourth delay a fourth logic state transition at said second output terminal, when said second input logic state transition is received at said input terminal, when said second and fourth delays being substantially equal; and



means, having a third output terminal and connected to said first and second output terminals, for providing a logic state transition on said third output terminal upon receiving each of said first, second, third and fourth logic state transitions.

5,068,548

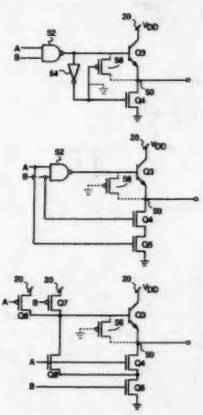
BICMOS LOGIC CIRCUIT FOR ASIC APPLICATIONS

Abbas El Gamel, Palo Alto, Calif., assignor to SiArc, Palo Alto, Calif.

Filed May 15, 1990, Ser. No. 524,207

Int. Cl.[5] H03K *19/01, 19/003, 19/082, 19/094*

U.S. Cl. 307—446 **26 Claims**



1. A BiCMOS binary logic circuit for performing logical operations comprising:

a pull-up bipolar transistor having a collector coupled to a first power supply terminal, having an emitter for providing a logic circuit output signal, and having a base coupled to receive a first input signal;

one or more pull-down N-channel transistors, each of said N-channel transistors having its drain coupled to said emitter of said bipolar transistor and its source coupled to

a second power supply terminal, a gate of each of said N-channel transistors being coupled to receive a second input signal; and

a CMOS binary logic circuit having one or more input terminals and coupled to said base of said bipolar transistor and to said gate of each of said N-channel transistors, said CMOS binary logic circuit operating to cause said first input signal to be of a logic state opposite that of said second input signal,

said BiCMOS binary logic circuit being connected within an integrated circuit so as not to buffer input signals applied to terminals of said integrated circuit or buffer output signals applied to terminals of said integrated circuit.

5,068,549

SEMICONDUCTOR INTEGRATED CIRCUIT APPARATUS HAVING PROGRAMMABLE LOGIC DEVICE

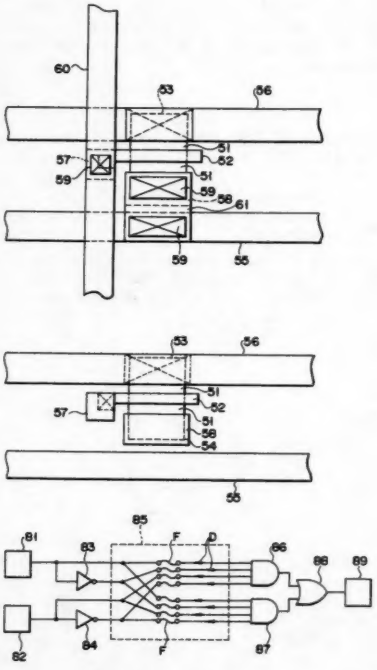
Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 16, 1990, Ser. No. 614,261

Claims priority, application Japan, Nov. 20, 1989, 1-299856

Int. Cl.[5] H03K *19/177, 5/08, 19/092, 3/01*

U.S. Cl. 307—465.1 **10 Claims**



1. A semiconductor integrated circuit apparatus comprising:

a programming region having an AND region and an OR region, wherein

said AND region and said OR region are programmed, whether an opening for connecting a metal wire in said programming region is present or absent is determined in a manufacturing step in accordance with a content of a program performed in said programming region, and the program is performed by determining whether a programming element is connected to said metal wire through said opening or not.

5,068,550

ECL-TTL SIGNAL LEVEL CONVERTER

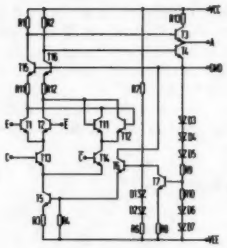
Claude Barre, München, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Oct. 9, 1990, Ser. No. 594,732

Claims priority, application European Pat. Off., Oct. 6, 1989, 89118610.8

Int. Cl.[5] H03K *19/092, 19/086, 17/60*

U.S. Cl. 307—475 **4 Claims**



1. ECL-TTL signal level converter, comprising:

a first transistor pair having transistors with bases controlled by ECL signals, collectors and coupled emitters;

a second transistor pair having coupled bases connected to a ground potential, emitters each being connected to a respective one of the collectors of said transistors of said first transistor pair, and collectors;

collector resistors each being connected between a respective one of the collectors of said transistors of said second transistor pair and a first supply potential;

a third transistor pair having transistors with coupled emitters, bases and collectors, the base of one of said transistors and the collector of the other of said transistors of said third transistor pair being connected to the collector of one of said transistors of said first transistor pair, and the collector of said one transistor and the base of said other transistor of said third transistor pair being connected to the collector of the other of said transistors of said first transistor pair;

a fourth transistor pair having transistors with bases controlled by control signals, coupled emitters and collectors, the collector of one of said transistors of said fourth transistor pair being connected to the coupled emitters of said transistors of said first transistor pair, and the collector of the other of said transistors of said fourth transistor pair being connected to the coupled emitters of said transistors of said third transistor pair;

current impressing means connected in common between the coupled emitters of said transistors of said fourth transistor pair and a second supply potential; and

a push-pull output stage connected to the collectors of said transistors of said second transistor pair for the emission of a TTL signal.

5,068,551

APPARATUS AND METHOD FOR TRANSLATING ECL SIGNALS TO CMOS SIGNALS

Robert J. Bosnyak, Tacoma, Wash., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 21, 1990, Ser. No. 586,068

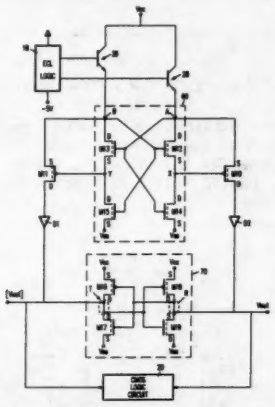
Int. Cl.[5] H03K *19/0175*

U.S. Cl. 307—475 **10 Claims**

1. A translator for translating signals operating within a first predetermined logic level range to a second predetermined logic level range, the translator comprising:

receiving means for receiving signals operating within the first predetermined logic level range, the receiving means including a first bipolar transistor arranged in a first emitter-follower configuration for receiving a first input signal and a second bipolar transistor, complementary to said first bipolar transistor, arranged in a second emitter-follower configuration for receiving a second input signal complementary to said first input signal;

generation means internal to said translator for generating a dynamic reference signal;



translation means, coupled to said receiving means and said generation means, for translating said signals within the first predetermined logic level range to the second predetermined logic level range, said translation means operating on said internal reference signal, said translation means including first and third MOS transistors having their respective gates coupled to the emitter of said first bipolar transistor, and second and fourth MOS transistors having their respective gates coupled to the emitter of said second bipolar transistor; and

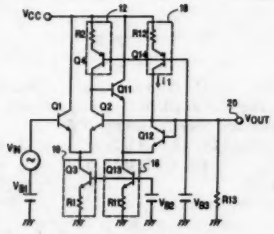
output means, coupled to said translation means, for outputting said translated signals.

5,068,552

VOLTAGE FOLLOWER CIRCUIT HAVING IMPROVED DYNAMIC RANGE

Yuuzi Itou, and Syuniti Tutida, both of Saitama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 10, 1990, Ser. No. 579,628
Int. Cl.[5] H03K 5/22
U.S. Cl. 307—494 **6 Claims**



1. A voltage follower circuit comprising:

a differential amplifier including a first and a second transistor whose emitters are connected to each other, a first constant current source connected to said emitters and a second constant current source connected to the collector of said second transistor,

a third transistor, having a base connected to the collector of said second transistor, the first and third transistors having collectors connected to a reference voltage,

a diode connected between the emitter of said third transistor and the base of said second transistor,

a third constant current source connected to the emitter of said third transistor, and

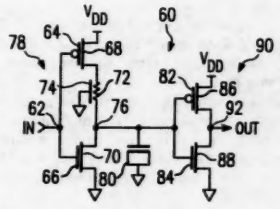
a fourth constant current source connected to the base of said second transistor wherein the base of said first transistor receives an input signal and wherein the base of said second transistor is an output terminal.

5,068,553

DELAY STAGE WITH REDUCED V_{dd} DEPENDENCE

Andrew M. Love, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 265,106, Oct. 31, 1988, abandoned.
This application Jul. 24, 1990, Ser. No. 559,433
Int. Cl.[5] H03K 5/13
U.S. Cl. 307—605 **11 Claims**



1. A delay stage circuit comprising:

a p-channel input transistor having a first electrode for receiving an input signal, said transistor providing a current path between a voltage supply and an internal node;

an inverter having an input node for receiving a signal from the current path and an output node for providing an output signal a predetermined time after the input signal is received at the first electrode, said inverter including a first p-channel transistor having a current path connected in series with a current path of a second transistor, said first transistor having a conductivity different from said second transistor, control electrodes of said first and second transistors coupled in common, forming said input node, and coupled to said internal node, and said output node coupled between current paths of said first and second transistors, the channels of said first and second transistors having predetermined width to length ratios, the width to length ratio of said first transistor being about ten times the width to length ratio of said second transistor;

a fixed resistor coupled in series in the current path between the input transistor and the internal node, said resistor providing greater resistance along the current path than said input transistor;

a capacitor having a first terminal connected to the internal node and a second terminal connected to a reference potential; and

a trigger point for inverting a rising voltage at said internal node is approximately equal to the difference between the level of the voltage supply and the threshold voltage of said first transistor.

5,068,554

ELECTRIC MOTOR

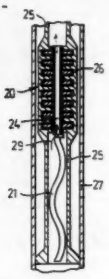
Frank Mohn, London, England, assignor to Framo Developments (UK) Limited, London, England

Filed Aug. 30, 1989, Ser. No. 400,773

Claims priority, application United Kingdom, Aug. 30, 1988, 8820444

Int. Cl.[5] H02K *41/00*

U.S. Cl. 310—12 **22 Claims**



1. An electric motor comprising:
a housing,
an output shaft having a longitudinal axis,
means mounting said shaft in said housing for relative rotation around said axis and relative translation along said axis,
electrical drive means carried by one of said shaft and said housing, said drive means comprising a plurality of axially spaced linear motor type annular windings oriented around said axis,
driven means comprising a plurality of axially spaced discs of magnetic material carried by the other of said shaft and said housing, said drive and driven means having co-operating faces extending laterally of said shaft axis, and said drive means being energizable to act on said driven means, and
energizing means selectively operable to energize said drive means so as to cause at least one of said relative rotation and said relative translation.

5,068,555

DUST EXHAUSTER FOR A VACUUM CLEANER HAVING IMPROVED COOLING

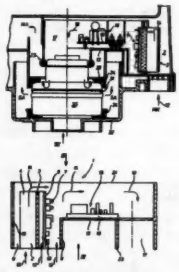
Rainer Oberdorfer-Bögel, Mozartstrasse 9, Kirchberg/Iller, Fed. Rep. of Germany 7959

Filed Aug. 13, 1990, Ser. No. 566,735

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928313

Int. Cl.[5] A47L *9/00*

U.S. Cl. 310—52 **3 Claims**



1. A dust exhauster, providing electric component cooling comprising: an electric motor connected to a lower plate and connected to an upper anchoring plate; electric components vertically and horizontally mounted on boards inside a U-shaped motor cooling intake channel providing cooling air for the electric motor, wherein the electric motor is a commutatorless D.C. motor and at least one of the vertically and horizontally mounted boards are positioned within the U-shaped motor cooling air intake channel, the motor cooling intake channel having a first vertical channel positioned in the direction of cooling air flow, a horizontal section connected to one end of the first channel, and a second vertical channel connected to the opposing end of the horizontal section, the second vertical channel of the U-shaped motor cooling channel being hermetically connected to an upper part of the electric motor.

5,068,556

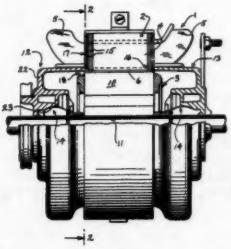
BEARING BRACKET FOR A DYNAMOELECTRIC MACHINE

Robert E. Lykes, and James L. King, both of Troy, Ohio, assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Sep. 7, 1989, Ser. No. 404,095

Int. Cl.[5] H02K *5/16, 7/08, 15/14*

U.S. Cl. 310—90 **17 Claims**



1. In a motor structure including a rotor core mounted within the bore of an annular stator core having a constant diameter bore opening and with an operative air gap between the stator core and rotor core, said rotor core mounted on a shaft projecting coaxially from opposite ends thereof with an axis to establish said air gap and having an outer cylindrical surface, the improvement comprising said stator core including a stack of laminations including end laminations having an enlarged bore defining a recess at each end of the stator core, the outer circumference of said enlarged bore being precisely formed with an axis coincident with the axis of said shaft, cup-shaped bearing support members secured one each to the opposite ends of said stator core and having outer end plates, a bearing unit in each of said end plates located on the axis of said stator core and supporting said shaft to define a self-contained rotor unit, said support members having precisely formed outer ends complementing said stator core recesses, and securement means connected to said support members and said core at sad recesses to secure said support members within said stator core recesses and thereby support said bearings and rotor unit.

5,068,557

GENERATOR WITH BEARING-RETAINING STATOR

Muthu K. Murugan, Howell, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

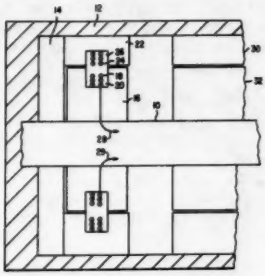
Filed Oct. 24, 1990, Ser. No. 603,964

Int. Cl.[5] H02K *5/16*

U.S. Cl. 310—90 **3 Claims**

1. A generator, comprising:
a generator housing;
a shaft;
a rotor connected to said shaft;
a stator inductively coupled to said rotor; and,
a bearing adjacent to said shaft for supporting said shaft for

rotation which is retained in place on a first side by said generator housing and on a second side by said stator,



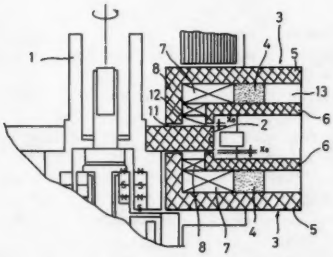
wherein said rotor and said bearing are adjacent to each other but spaced apart from each other.

5,068,558

MAGNETIC BEARING DEVICE

Akira Yamamura, Tokyo, Japan, assignor to Nippon Ferrofluidics Corporation, Tokyo, Japan

Continuation of Ser. No. 418,303, Oct. 6, 1989, abandoned. This application Jul. 27, 1990, Ser. No. 560,456
Claims priority, application Japan, Oct. 7, 1988, 63-254620
Int. Cl.[5] H02K *7/09*
U.S. Cl. 310—90.5 **1 Claim**



1. A magnetic bearing device comprising: a rotary main shaft; an armature disk mounted on said rotary main shaft; and a pair of bearing elements disposed on opposite sides of an axial direction of said armature disk, each of said bearing elements including a permanent magnet provided with a pair of pole pieces, a top end of each of the pole pieces being disposed near said armature disk, and a control coil being disposed between the pole pieces at a position nearer to a front end side of said bearing elements than the permanent magnet.

5,068,559

INDUCTION MOTOR SWITCHABLE BETWEEN SERIES DELTA AND PARALLEL WYE

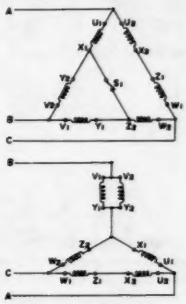
Toshihiko Satake, Higashihiroshima, and Yukio Onogi, Hiroshima, both of Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 588,921
Claims priority, application Japan, Oct. 5, 1989, 1-261446
Int. Cl.[5] H02P *1/32, 5/28, 8/00, 13/06*
U.S. Cl. 310—112 **10 Claims**

1. An induction motor comprising:

a single rotor formed in one-piece having a first and a second rotor core axially mounted on a common axis with an airspace or a non-magnetic portion being provided between said two rotor cores and having on said two rotor cores a plurality of rotor conductive members extending therethrough;

a first and a second stator disposed side by side and surroundingly facing said respective rotor cores, said first and second stators having a first and a second stator core on which a plurality of polyphase windings are being wound, said plurality of polyphase windings of said first and second stators being interconnected so as to form a series Δ-connection; and



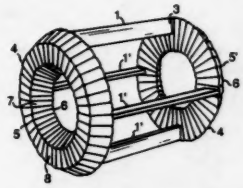
a phase changing means having short-circuiting switches disposed respectively between series-junction nodes of said respective stator windings of different phases of said first and second stators, for varying the phase difference between the rotational magnetic fields around said first rotor core generated by said first stator and the rotational magnetic fields around said second rotor core generated by said second stator by the operation of said short-circuiting switches.

5,068,560

REDUCED CURRENT STARTING MECHANISM FOR THREE PHASE SQUIRREL CAGE MOTORS

Lynn Lundquist, 10833 NE. Russell, Portland, Oreg. 97220

Filed Dec. 26, 1990, Ser. No. 634,056
Int. Cl.[5] H02K *17/18, 17/16*
U.S. Cl. 310—125 **22 Claims**



1. A rotor cage assembly for an alternating current motor including a rotor steel, comprising:

a segmented shorting ring having plural segmented areas therein;

plural, elongate rotor bars, each electrically connected to a segmented area of said shorting ring, with the segmented areas located on each end of said rotor bar;

shunting means selectively electrically connectable to said segmented shorting ring;

whereby said shunting means is constructed and arranged to selectively alter the current path within said shorting ring.

5,068,561

HOMOPOLAR ROTARY MACHINE WITH FLUX BYPASS

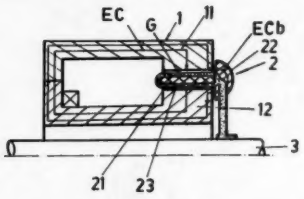
Woo S. Lee, 287, You Pyoung Li, Chung Cheong Puk Do, Rep. of Korea 367-850

Filed Jan. 17, 1990, Ser. No. 466,650

Claims priority, application Rep. of Korea, Jan. 23, 1989, 89690[U]

Int. Cl.[5] H02K *1/06, 21/36, 31/00*

U.S. Cl. 310—178 **4 Claims**



1. A homopolar rotary dynamoelectric machine comprising:

a hollow, annular cylindrically shaped magnetic field yoke of ferromagnetic material for conducting magnetic flux therethrough in a toroidal loop circuit around the hollow annulus in the annular yoke;

an annular slot through one end portion of the cylinder extending substantially parallel to the central axis of the cylinder to form an annular air gap through said flux loop at said one end portion and two opposed pole faces forming opposite sides of said gap;

an annular conductive member in said gap in substantially equally spaced relation to said opposed pole faces and supported for relative rotation with respect to said magnetic field yoke so that said conductive member passes transversely through magnetic flux in said gap; and

a plurality of substantially equally circumferentially spaced magnetic flux by-pass yokes of ferromagnetic material in adjacent closely spaced relation to at least one end of said gap for conducting at least a part of said magnetic flux so that said part of said flux by-passes around said gap reducing said flux passing through said gap thereby forming a plurality of alternating dense flux areas in said gap adjacent the spaces between said by-pass yokes and low density flux areas in said gap adjacent said by-pass yokes.

5,068,562

SMALL STEPPING MOTOR

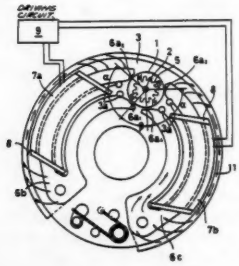
Shigeru Tagami; Yoshio Umedu, and Katsuhito Niwa, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 438,557

Claims priority, application Japan, Jan. 26, 1989, 63-17044

Int. Cl.[5] H02K *1/12, 37/00*

U.S. Cl. 310—256 **5 Claims**



3. A stepping motor having a rotor comprised of a radially magnetized permanent magnet, a mounting plate, said rotor being rotatably mounted to said plate, a stator having a pair of arcuate poles joined at one end, said stator being mounted to said plate with the unjoined poles thereof facing said rotor, a winding on said stator, and a leakage flux converging member mounted adjacent said stator to converge leakage magnetic flux from said stator or coil to pass through said stator.

5,068,563

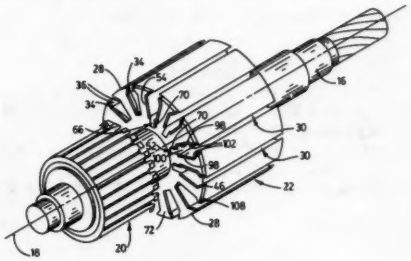
TAB INSULATORS FOR INSULATING ARMATURE CORE SLOTS

David H. Cummings, Waukesha, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Oct. 9, 1990, Ser. No. 594,727

Int. Cl.[5] H02K *1/22*

U.S. Cl. 310—261 **9 Claims**



1. An armature comprising:

a shaft supportable for rotation in a motor body and defining an axis;

a commutator on said shaft and rotatable with said shaft;

an armature core on said shaft, rotatable with said shaft and spaced from said commutator, said core having an end facing said commutator, an opposite end, and an outer generally cylindrical surface including a plurality of spaced apart slots adapted to have wire wound therein, each of the slots extending in a direction generally parallel to the axis;

a core end insulator on said opposite end of said core, said core end insulator having a side facing said core and having a side facing away from said core; and

insulator means, slidably mounted in one of said slots, for preventing an electrical connection between said core and wire wound in the slots, said insulator means comprising a main body portion having a first end generally aligned with said commutator facing end of said core, and having a second end generally aligned with said opposite end of said core, and said insulator means further comprising tab means extending from said second end of said main body portion and for preventing movement of said insulator means in said one of said slots in a direction parallel to the axis, said tab means extending out of said one of said slots and being bendable against the side of said core end insulator facing away from said core.

5,068,564

END RETAINER RING ASSEMBLY FOR ROTARY ELECTRICAL DEVICES

Joseph J. Frank, Esperance, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1990, Ser. No. 604,210

Int. Cl.[5] H02K *3/46*

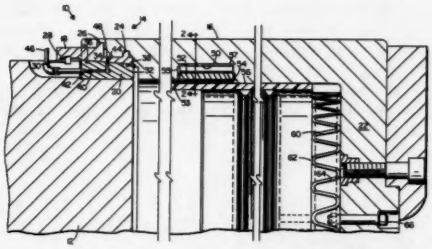
U.S. Cl. 310—270 **21 Claims**

1. A system for supporting end windings of a rotatable elec-

trical device having a rotor body rotatable about an axis and a rotor body end, comprising:

a primary retaining ring having an open end mountable to the rotor body end and an opposite end, said primary retaining ring being extendable beyond the rotor body end to support the end windings, said primary retaining ring being formed of a composite material;

an auxiliary ring carried by said primary retaining ring adjacent its open end and being integrally secured thereto, said auxiliary ring having a radially inwardly directed surface



tapering radially inwardly in a direction from said open end of said primary retaining ring toward said opposite end thereof; and

an inner retaining ring for overlying the rotor body end and having a radially outwardly directed surface tapering radially inwardly toward the axis in a direction toward said opposite end of said primary retaining ring, the tapered surface of said inner retaining ring being generally complementary to and for mating engagement with the tapered surface of said auxiliary ring.

5,068,565

MOTOR CONVERSION MECHANISM UTILIZING ELASTIC ACTION

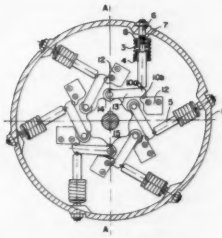
DaXu Huang, 186 An Yuan Lu, Shanghai, China

Filed Jan. 4, 1990, Ser. No. 461,034

Claims priority, application China, Jan. 30, 1989, 89100596

Int. Cl.[5] H01L *41/08*; H02N *2/00*

U.S. Cl. 310—328 **27 Claims**



13. A motion conversion mechanism for converting micro amplitude oscillatory motion into continuous motion related to the oscillatory motion comprising:

a moving mechanism including a moving member;

elastic force field means encompassing and being operatively connected to said moving member for providing a continuous elastic bias on said moving member, said elastic bias providing a substantially balanced force on said working member in the absence of an additive force; and

actuator means for presenting an additive force to said elastic force field means, said actuator means effecting a perturbation of the elastic force means by upsetting balance of forces acting on the moving member at rest to cause an unbalance of force resulting in an output motion of the moving member.

5,068,566

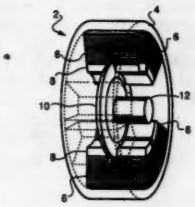
ELECTRIC TRACTION MOTOR

Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 4, 1990, Ser. No. 532,837

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—328 **16 Claims**



1. An electric traction motor, comprising:

a motor housing;

at least one pair of actuators disposed inside said housing;

activatable to provide cyclical walking traction wherein each of said actuators comprises a tangentially acting segment attached to said housing and a pair of opposing axially acting segments attached to said tangentially acting segment;

a motor shaft extending inside said housing having a flange attached thereto, wherein said flange comprises a disk-shaped rotor and said shaft extends from an axis of rotation of said rotor, said rotor engagable by said actuators for rotation of said rotor and shaft.

5,068,567

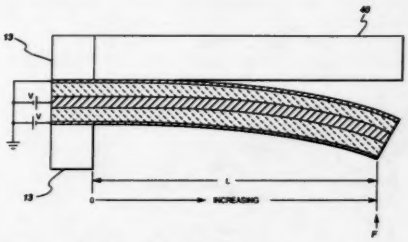
APPARATUS FOR INCREASING THE RECOVERABLE ENERGY OF A PIEZOELECTRIC BENDER

Donald W. Jones, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1990, Ser. No. 603,647

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—332 **5 Claims**



2. A piezoelectric bender, comprising:

a cantilever-mounted piezoelectric core portion having two oppositely polarized strips of piezoelectric material, said piezoelectric core portion having a free end and a fixed end;

at least two electrodes, one of said electrodes disposed on either outer surface of said core portion, said piezoelectric core portion bending in a predetermined direction when a voltage signal is applied between said electrodes; and

a flat back-up plate disposed adjacent, but unattached, to the outer surface of said piezoelectric core portion which is opposite to the direction of displacement of said bender, said back-up plate being positioned so as to minimize the

curvature of said piezoelectric bender when said bender is energized to apply a force at the free end thereof in said predetermined direction away from said back-up plate, thereby maximizing the potential energy recoverable therefrom, the length of said back-up plate extending from a point adjacent to said fixed end of said piezoelectric core portion to a point a predetermined distance from said fixed end.

5,068,568

CATHODE RAY TUBE HAVING MULTILAYER INTERFERENCE FILTER

Henricus M. de Vrieze; Johannes H. J. Roosen, and Leendert Vriens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

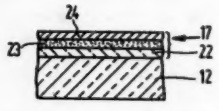
Continuation of Ser. No. 14,566, Feb. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 742,834, Jun. 10, 1985, Pat. No. 4,647,812, which is a continuation-in-part of Ser. No. 662,311, Oct. 18, 1984, Pat. No. 4,634,926. This application May 15, 1990, Ser. No. 524,718

Claims priority, application United Kingdom, May 21, 1986, 8612358

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[5] H01J *29/10*

U.S. Cl. 313—474 **27 Claims**



1. A method of making a multilayer interference filter provided on an internally facing surface of a faceplate of a cathode ray tube, the method comprising depositing alternate layers of a material having a relatively high refractive index and a material having a relatively low refractive index on the faceplate, the material having a relatively high refractive index comprising niobium pentoxide.

5,068,569

WAVE GUIDE DEVICE HAVING A PERIODIC STRUCTURE AND IMPROVED HEAT DISSIPATION

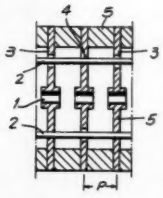
Guido Busacca, and Antonio Muratore, both of Palermo, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Jun. 8, 1990, Ser. No. 535,388

Claims priority, application Italy, Jun. 9, 1989, 48070 A/89

Int. Cl.[5] H01J *25/34*

U.S. Cl. 315—3.5 **6 Claims**



1. An apparatus having a projected ion beam and a periodic structure for guiding electromagnetic waves propagating along a longitudinal axis of the structure at a speed below the velocity of light and for providing dissipation of heat provided in the structure, said structure comprising:

a series of metal polar expansions aligned with said axis and forming a plurality of resonant metal cavities;

said polar expansions having respective freeway apertures aligned with each other so as to form a freeway for electron flow of said ion beam;

first and second conductors traveling at least the length of at least two of said expansions in said series and having an electrically conductive wire having a core and a surface portion having a greater resistance than the core, for cooperating with the polar expansions;

said polar expansions each further respectively having first and second conductive apertures for receiving said first and second conductors; and

said first conductors being short circuited only to alternate ones of said polar expansions, and said second conductors being short circuited only to respective alternate ones of said polar expansions such that each polar expansion is short circuited only to one of said first and second conductors while providing an aperture of sufficient diameter for said nonshort circuited conductor to pass therethrough and for heat to be dissipated from said non-short circuited conductor.

5,068,570

LAMP LIGHTING CIRCUIT WITH AN OVERLOAD PROTECTION CAPABILITY

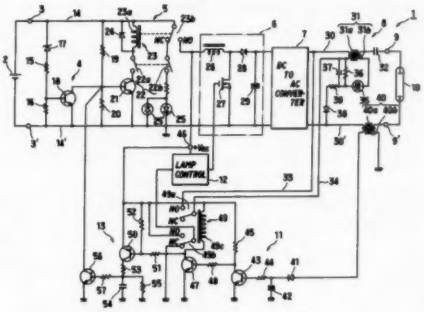
Goichi Oda; Masaya Shidoh; Atsushi Toda; Akiyoshi Ozaki; Akihiro Matsumoto; Soichi Yagi, and Atsuhiko Murata, all of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Shizuoka, Japan

Filed Jan. 24, 1990, Ser. No. 469,876

Claims priority, application Japan, Jan. 26, 1989, 1-16574; Dec. 7, 1989, 1-318481

Int. Cl.[5] H05B *41/00*

U.S. Cl. 315—128 **17 Claims**



7. A lamp lighting circuit for connection between a power supply and an electric lamp, comprising:

(a) a pair of input terminals between which the power supply is to be connected;

(b) a pair of output terminals between which the lamp is to be connected;

(c) an operator actuated lamp switch connected between the input and output terminals;

(d) a protection switch connected in series with the lamp switch;

(e) a relay coil connected in series with the lamp switch and the protection switch whereby the relay coil is energized only when both lamp switch and protection switch are closed;

(f) a relay switch connected between the input and output terminals and actuated by the relay coil for closing the lighting circuit when the relay coil is energized;

(g) overvoltage detector means connected to the protection switch for opening the same when the output voltage of the power supply exceeds a predetermined value; and

(h) lamp failure detector means connected to the protection switch for opening the same when the lamp remains unlit

for a predetermined time following the closure of the lamp switch.

5,068,571

SWITCHED BRIDGE CIRCUIT

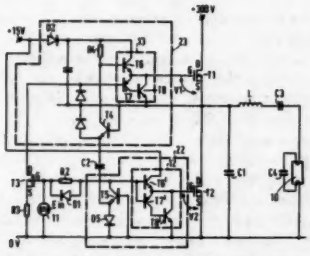
Franciscus A. C. M. Schoofs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 13, 1990, Ser. No. 553,476

Claims priority, application United Kingdom, Jul. 19, 1989, 8916451

Int. Cl.[5] H05B *41/14*

U.S. Cl. 315—205 24 Claims



1. A switched bridge circuit in which semiconductor bridge elements (T1,T2) are arranged to provide a commutated output voltage from a d.c. supply source in response to a switching signal, characterised in that a control circuit for switching the bridge elements has its output connected to a capacitor (C2) such that switching of the bridge elements (T1,T2) is prevented whilst there is a flow of current through the capacitor (C2), which is indicative of changing output voltage.

5,068,572

SWITCH MODE POWER SUPPLY

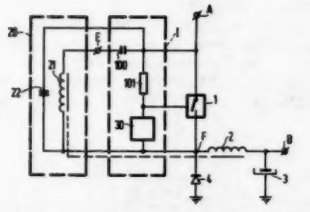
Hendrik J. Blankers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1990, Ser. No. 524,251

Claims priority, application Netherlands, Jun. 8, 1989, 8901459

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—209 R 14 Claims



1. A switch mode power supply for ignition and operation of a high-pressure discharge lamp comprising:

switching means, induction means, capacitive buffer means and rectifying means coupled together to form a switch mode power supply coupled between an input voltage terminal and the lamp so as to supply a current to the lamp from an input voltage at the input terminal by switching the switching means alternately to a conducting state and to a non-conducting state,

a control circuit for supplying to a control terminal of the switching means a switching signal comprising a switching-on signal for switching the switching means to the conducting state and a switching-off signal for switching the switching means to the non-conducting state, and

circuit means, which include said induction means, coupled to the control circuit, said circuit means providing current detection of a current in the induction means and at the same time producing the switching signal, where the circuit means further comprise a first winding part of the induction means operative as a source for producing the switching on signal.

5,068,573

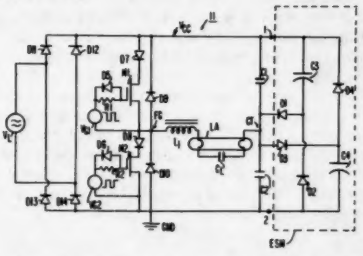
POWER SUPPLY WITH ENERGY STORAGE FOR IMPROVED VOLTAGE REGULATION

Gert W. Bruning, Tuckahoe, and Paul R. Veldman, Mt. Kisco, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Sep. 20, 1990, Ser. No. 585,574

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—209 R 6 Claims



1. A voltage regulated power supply including two circuit lines and a source of full wave rectified pulsating positive voltage connected across said two circuit lines, a bridge inverter connected between said two circuit lines, said bridge inverter supplying high frequency current to said circuit lines in response to said pulsating positive voltage across said two circuit lines, a load circuit connected between said two circuit lines and conducting a load current in accordance with said high frequency current, one of said circuit lines operating as a positive voltage line for said load circuit and the other circuit line operating as a return line between said load circuit and said bridge inverter and an energy storage means connected in series circuit with said load circuit, said energy storage means receiving said load current and storing energy in accordance therewith, said energy storage means providing energy to said positive voltage line whenever the pulsating positive voltage decreases below a predetermined minimum whereby the voltage on the positive voltage line is regulated by the energy stored in the energy storage means as a result of the load current received thereby and also including a first capacitor connected between said positive voltage line and one end of said load circuit, said first capacitor and said load circuit forming a node at the connection between them, and wherein said energy storage means includes a second capacitor and a first diode being connected in series with each other and forming a connection therebetween and being connected in parallel across said first capacitor, said first diode being poled to prevent current flow from said node directly to said second capacitor and a second diode connected from the connection between said second capacitor and said first diode to said return line and being poled to prevent current flow through said second capacitor directly to said return line.

5,068,574

LIGHTING DEVICE FOR FLUORESCENT DISCHARGE TUBE

Yoshiharu Koda, and Tadashi Takashima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Denkosha, Tokyo, Japan

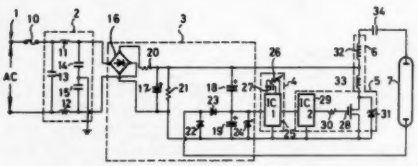
Continuation-in-part of Ser. No. 346,651, May 3, 1989, Pat. No. 4,999,546. This application Mar. 20, 1990, Ser. No. 496,543

Claims priority, application Japan, Jan. 30, 1989, 1-17591; Mar. 10, 1989, 1-56068

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—225 **2 Claims**



1. A discharge tube lighting device comprising rectifying means connected to an AC power source and adapted to transform an AC voltage from said AC power source into a stable DC voltage, pulse generating means driven by the DC voltage issued from said rectifying means and consequently caused to emit high-frequency pulse signals of a fixed duty ratio, adjusting means for varying the frequency of the pulse issued from said pulse generating means, high-voltage applying means for applying high voltage to a discharge tube, and switching means for driving said high-voltage applying means synchronously with the high-frequency pulse signals issued from said pulse generating means, wherein electrodes disposed one each at the opposite terminals of said discharge tube are severally connected with one connecting wire to said high-voltage applying means so that said discharge tube may be lighted without requiring said electrodes to be preheated.

5,068,575

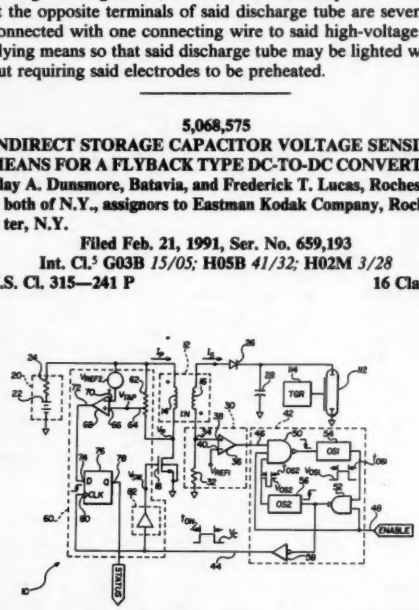
INDIRECT STORAGE CAPACITOR VOLTAGE SENSING MEANS FOR A FLYBACK TYPE DC-TO-DC CONVERTER

Clay A. Dunsmore, Batavia, and Frederick T. Lucas, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 21, 1991, Ser. No. 659,193

Int. Cl.[5] G03B *15/05*; H05B *41/32*; H02M *3/28*

U.S. Cl. 315—241 P **16 Claims**



1. In a flyback type self-oscillating DC-to-DC converter having a high voltage storage capacitor, a coupled inductor having primary and secondary windings, a switching means coupled to the primary winding, and a control means, wherein the control means alternately activates and deactivates the switching means so that current induced in the secondary winding in response to current action in the primary winding charges the storage capacitor; a voltage sensing means for indirectly sensing the storage capacitor voltage and indicating when the voltage across the storage capacitor has been charged to a predetermined charged voltage, comprising:

a voltage dividing resistor connected across the primary winding, the resistor having a tap intermediate the ends thereof, the voltage across the primary winding corresponding to a voltage on the storage capacitor according to the turns ratio of the primary winding to the secondary winding measured during a measurement period, the measurement period having first and second portions and being a period of time when the control means deactivates the switching means whereby current flows in the secondary winding;

a predetermined reference voltage;

means for comparing a voltage at the tap of said voltage dividing resistor with the predetermined reference voltage, the tap on said voltage dividing resistor being set to correspond to the predetermined reference voltage when the voltage on the storage capacitor is at the predetermined charged voltage, said comparing means providing an output signal having (a) a first condition when the tap voltage is below said predetermined reference voltage corresponding to the storage capacitor voltage being below the desired charged voltage and (b) having a second condition when the tap voltage is above said predetermined reference voltage corresponding to the storage capacitor voltage being above the desired charges voltage, said output signal being susceptible to fluctuations between said first and second conditions during the first portion of the measurement period; and

means for latching said comparing means output signal during the second portion of the measurement period, the second portion being subsequent to the first portion, said latching means being coupled to said comparing means and the control means.

5,068,576

REMOTE CONTROL OF FLUORESCENT LAMP BALLAST USING POWER FLOW INTERRUPTION CODING WITH MEANS TO MAINTAIN FILAMENT VOLTAGE SUBSTANTIALLY CONSTANT AS THE LAMP VOLTAGE DECREASES

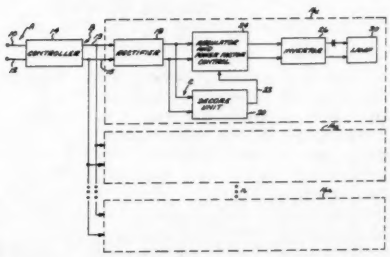
Feng-Kang Hu; Chung M. Lau; Kevin Yang; Joshau S. Zhu, all of Torrance; Peter S. Shen, Rancho Palos Verdes, all of Calif., and Thomas C. Jednacz, Gastonia, N.C., assignors to Electronic Ballast Technology, Inc., Torrance, Calif.

Filed Aug. 13, 1990, Ser. No. 565,711

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.[5] G05F *1/00*; H05B *41/36*

U.S. Cl. 315—291 **7 Claims**



1. A dimmable fluorescent lamp ballast system comprising:

means for providing a first AC voltage signal;

encoder means connected to said AC voltage for providing a cyclical signal, each cycle containing a missing pulse;

decoder means responsive to said signal for providing a DC voltage signal having a magnitude predetermined by the

time period between missing pulses in successive cycles of said pulse train;

a fluorescent lamp having filament means associated therewith;

first circuit means responsive to said DC voltage signal for generating a first AC signal having a magnitude proportional to the magnitude of said DC voltage signal, said first AC signal being coupled to said fluorescent lamp; and

second circuit means responsive to said DC voltage signal for generating a second AC voltage signal having a magnitude proportional to the resonant frequency of said second circuit means, said second AC voltage signal being applied to said lamp filament means, a decrease in the magnitude of said first AC voltage signal from a first level to a second level causing said second circuit means to maintain the magnitude of said second AC voltage signal at a value at least equal to the value when said first AC signal was at said first level.

5,068,577

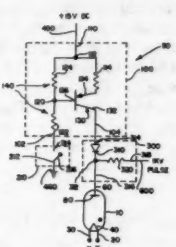
CONSTANT CURRENT DRIVE SYSTEM FOR FLUORESCENT TUBES

Brent W. Brown, Logan, Utah, assignor to Integrated Systems Engineering, Inc., Logan, Utah

Filed Nov. 19, 1990, Ser. No. 615,690

Int. Cl.[5] H05B *41/36, 41/44*

U.S. Cl. 315—307 **31 Claims**



1. A system for selectively igniting and maintaining constant conduction and illumination and extinguishing illumination in a gas discharge tube having at least two electrodes and ignition and illumination maintaining voltage levels which are greater than a maximum safe logic voltage level, said system comprising:

first means for selectively communicating the gas discharge tube igniting voltage to a first electrode of the gas discharge tube;

a substantially constant DC illumination maintaining voltage power supply comprising means for providing an illumination maintaining voltage reference level and means for providing a low voltage reference level;

a well regulated logic voltage level power supply, the electrical current flow through which is substantially independent of changes in electrical current flowing through the gas discharge tube;

second means, comprising an on/off semiconductor gate in series with the gas discharge tube, for communicating a substantially constant current to the first electrode of the gas discharge tube during the period of illumination;

third means for communicating the low voltage reference level to a second electrode of the gas discharge tube whereby the voltage drop across the tube is sufficient to maintain tube illumination;

fourth means, comprising logic voltage level gating circuits electrically connected to the on/off semiconductor gate, for selectively terminating conduction in the on/off semiconductor gate thereby extinguishing illumination in the gas discharge tube.

5,068,578

CIRCUIT ARRANGEMENT FOR SUPPLYING A LOAD

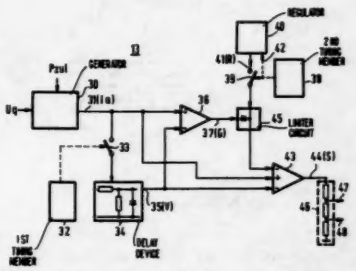
Armin Wegener, Aachen, Fed. Rep. of Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1990, Ser. No. 574,418

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 39288810

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—307 **13 Claims**



1. A circuit arrangement for supplying a load (1) from a direct voltage source (2,3) through a circuit part (4), comprising a control circuit (13) for controlling the current through the load (1) in a starting time interval after it has been put into operation, characterized in that the control circuit (13) includes

determining means for determining a starting value (Ia) for the current through the load (1) from a given power (Pzul) to be at most consumed by the load (1) and the voltage (Uq) delivered by the direct voltage source,

deriving means for deriving—beginning after termination of a first delay time (t1) after start of the operation a reduction value (V) gradually increasing from zero to a final value from the starting value (Ia),

first forming means for forming a limiting current value (G) as a linear combination of the starting value (Ia) and the reduction value (V),

supplying means for supplying—beginning after termination of a second delay time (t2) after start of the operation on a regulation signal (R) of a regulator (4) whilst simultaneously limiting the value of the regulation signal (R) to the limiting current value (G), and

second forming means for forming a control signal (S) for controlling the current through the load as a linear combination of the starting value (Ia), of the reduction value (V) and of the regulation signal (R).

5,068,579

FLAT CONFIGURATION COLOR CRT DISPLAY APPARATUS WITH SCANNING CORRECTION FOR COMPONENT POSITIONING ERROR

Kaoru Tomii, Isehara; Hiroshi Miyama, Yokohama, and Yoshikazu Kawauchi, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 18, 1990, Ser. No. 524,953

Claims priority, application Japan, May 19, 1989, 1-126951

Int. Cl.[5] H01J *29/70, 29/72*

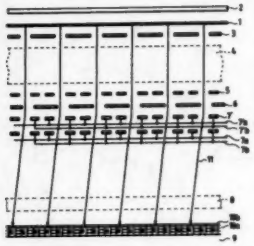
U.S. Cl. 315—366 **12 Claims**

1. In a flat configuration image display apparatus including means for generating a plurality of electron beams within an evacuated containing envelope, modulation electrode means for modulating said electron beams, means for applying electron beam modulation signals to said modulation electrode means, a display surface formed with a pattern of fluorescent layer portions, and scanning means for deflecting said electron beams as an array of horizontal scan lines traversing said fluorescent layer portions, said scanning means including main horizontal deflection electrodes for horizontally deflecting said electron beams and main horizontal deflection voltage

generating means for applying between said main horizontal deflection electrodes a main horizontal deflection voltage having a sawtooth waveform with a period equal to a horizontal scanning period, the improvement comprising:

correction deflection electrodes positioned to horizontally deflect said electron beams; and

correction deflection voltage generating means for applying



between said correction deflection electrodes a correction deflection voltage having a sawtooth waveform with a period that is substantially equal to 1/n times said horizontal scanning period, where n is a fixed integer of value 2 or more, said sawtooth waveform of the correction deflection voltage and said sawtooth waveform of the main horizontal deflection voltage having mutually opposite directions of slope.

5,068,580

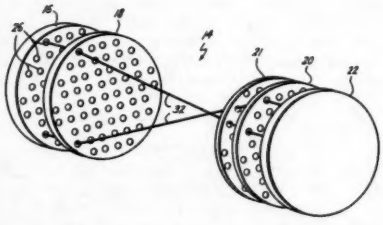
ELECTRICAL BEAM SWITCH

Lawrence N. Smith, Austin; Ollie C. Woodard, Sr., Buda, and Dennis J. Herrell, Austin, all of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed May 30, 1989, Ser. No. 359,019

Int. Cl.[5] G09G *1/04*; H01J *29/70*; H04Q *1/28*

U.S. Cl. 315—366 **12 Claims**



1. An electron beam crossbar switch for interconnection between processors or memory units comprising,

a two dimensional array of electron emitter source device,

a separate data input connected to each of the electron emitters,

a two dimensional array of independent and unrelated data output detectors positioned relative to the array of electron emitter devices for receiving electrons from any of the emitter devices,

x and y deflection means positioned adjacent each of the electron emitters for individually directing the electrons from each of the emitters to a selected one of any of the detectors, and

separate address means connected to each of the deflection means for individually directing the data input to each emitter to a different selected detector.

5,068,581

HORIZONTAL DEFLECTION CIRCUIT FOR HIGH-FREQUENCY SCANNING

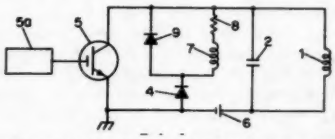
Akira Nishiura, Matumoto; Naoki Kumagai, Yokosuka, and Yasukazu Seki, Kanagawa, all of Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Aug. 27, 1990, Ser. No. 573,635

Claims priority, application Japan, Aug. 30, 1989, 1-223503

Int. Cl.[5] G09G *1/04*; H01J *29/70*

U.S. Cl. 315—370 **12 Claims**



1. A horizontal deflection circuit, suitable for use with high frequency scanning rates up to 60 KHz, comprising:

a horizontal deflection coil;

a capacitor coupled across said horiziontal deflection coil;

switching means, for coupling a source of power to said horizontal deflection coil and capacitor combination, including a semiconductor device capable of high frequency switching but subject to an inherent delay effect in current switching; and

a circuit coupled across said switching means including a series combination of diode means for enabling a flow of reverse recovery current during a portion of a deflection cycle and compensation means for delaying an increase in magnitude of current flow through said diode means during said reverse recovery current flow in compensation for said inherent delay effect;

whereby, distortion of horizontal deflection coil voltage due to said inherent delay effect is avoided by said current increase delay produced by said compensation means.

5,068,582

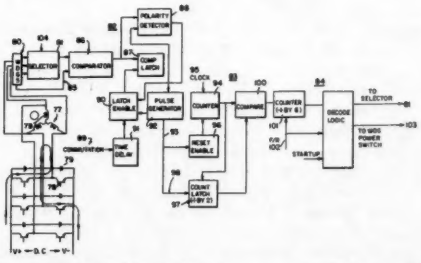
BRUSHLESS PULSED D.C. MOTOR

Kenneth C. Scott, San Diego, Calif., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 29, 1990, Ser. No. 529,920

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—254 **16 Claims**



1. A commutated brushless dc motor comprising a stator with a plurality of circumferentially spaced stator windings, a rotor coupled to said stator and rotatably mounted to rotate relative to said stator winding as the result of energization of said windings, a dc power supply to establish pulsed energization of said windings in sequence with at least one winding de-energized, an alternating current induced signal being induced in said de-energized winding and having periodic zero crossings, a timing device coupled to the stator to monitor the time between the zero crossings of said induced signal and generating an electrical zero crossing signal proportional to such time, a signal latch unit coupled to said timing device and

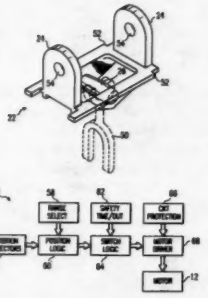
storing the zero crossing signal as a latched signal, a reset unit connected to said timing device to initiate a new timing cycle to generate a next zero crossing signal, and a comparator connected to said timing device and said latch unit and responsive to a proportion of the latched signal to generate said pulsed energization of said windings in a continuous repetitive sequence.

5,068,583

ELECTRONIC SHIFTER

Gary E. Gresham, Fort Worth, and Burnis H. Tucker, Joshua, both of Tex., assignors to Transportation Technologies, Inc., Forth Worth, Tex.

Filed Aug. 15, 1990, Ser. No. 567,913
Int. Cl.[5] B60K *20/00*
U.S. Cl. 318—266 **18 Claims**



1. Apparatus for shifting between gear ratios comprising:
a rigid housing;
a carriage assembly slideably engaged between first and second positions within said housing;
spring means operable to provide an impetus to said carriage assembly to move said carriage assembly between said first and second positions;
first control means for indicating a desired gear ratio selected by an operator;
electronic sensing circuitry for generating an output indicative of the position of the carriage assembly within the housing; and
second control means for compressing said spring means responsive to said sensing circuitry and said first control means.

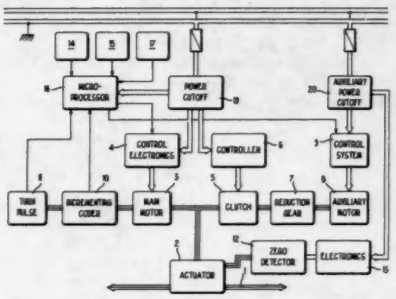
5,068,584

AUXILIARY DEVICE FOR HANDLING FAILURES OF AN ACTUATING SYSTEM OF A LINEAR ELECTRIC ACTUATOR

Gérard Herent, Meudon; Michel Mahe, Chaville, and Alex Romagny, La Celle Saint-Cloud, all of France, assignors to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Nov. 29, 1989, Ser. No. 442,586
Claims priority, application France, Nov. 29, 1988, 88 15555
Int. Cl.[5] B62D *5/04*
U.S. Cl. 318—549 **17 Claims**

1. An auxiliary device for handling failures of an actuating system of a linear electric actuator, comprising:
auxiliary drive means for returning said actuator to a zero position in case of failure of said actuating system; and
braking means for maintaining said actuator in said zero position in opposition to any mechanical action;
wherein said actuating system comprises a main motor, said auxiliary drive means comprises a small auxiliary motor



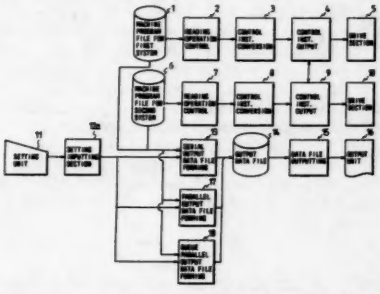
and said braking means comprises an irreversible reduction gear joined to a clutch.

5,068,585

NUMERICAL CONTROL DEVICE

Kiyoshi Kuchiki, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed May 2, 1990, Ser. No. 518,631
Claims priority, application Japan, May 8, 1989, 1-114639
Int. Cl.[5] G06F *15/46*; G05B *19/405*
U.S. Cl. 318—569 **4 Claims**



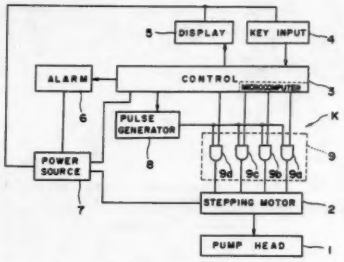
1. A numerical control device which is capable of controlling at least two external units in parallel mode according to a plurality of machining programs, respectively, comprising:
memory means for storing the plurality of machining programs each of which is assigned to one of said units;
a first data file forming means for reading the plurality of machining programs to form a first data file in which a first series of steps of execution for one of said plurality of machining program sis arranged in parallel with at least a second series of steps of execution for the another of said plurality of machining programs;
a second data file forming means for reading the plurality of machining programs to form a second data file in which said first series of steps of execution for said one of said plurality of machining programs is arranged in parallel with at least said second series of steps of execution for another of said plurality of machining programs, said second data file forming means being responsive to queuing instructions contained in said first series of steps and said second series of steps for synchronizing the parallel arrangement;
setting means for selecting and starting either said first or second data file forming means; and
output means for selectively displaying outputs of one of said first and second data forming means.

5,068,586

STEEPING MOTOR DRIVING APPARATUS

Masafumi Kawahara, Nara, Japan; George A. Bowman, Vernon Hills, and Joseph B. Matthews, Grayslake, both of Ill., assignors to Sharp Kabushiki Kaisha, Osaka, Japan and Baxter Int'l. Inc., Deerfield, Ill.

Filed Jun. 22, 1990, Ser. No. 541,953
Claims priority, application Japan, Jun. 28, 1989, 1-165640
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 17 Claims



1. A stepping motor driving apparatus for driving a stepping motor having a plurality of excitation coils and subject to varying load at a desired speed comprising:

a pulse output circuit for outputting drive pulses at a drive pulse frequency for driving said stepping motor;

a pulse generator for generating further pulses having a frequency higher than the drive pulse frequency;

gating means receiving the drive pulses from said pulse output circuit and the further pulses from said pulse generator, for selectively modulating said drive pulses with said further pulses to produce modulated drive pulses and supplying said modulated drive pulses to said excitation coils only when said modulated drive pulses produce a toreque sufficient to drive the load at a desired speed, said modulation of sai drive pulses by said gating means reducing the power consumed by said stepping motor;

said gating means directly supplying only said drive pulses without modulation by said further pulses to said excitation coils when said modulated drive pulses do not produce a torque sufficient to drive the load at the desired speed.

5,068,587

SPINDLE DRIVE CONTROL APPARATUS FOR A MACHINE TOOL

Kosei Nakamura; Shinichi Kono; Kazuhisa Numai; all of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/01276, § 371 Date Aug. 1, 1989, § 102(e) Date Aug. 1, 1989, PCT Pub. No. WO89/06067, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 16, 1988, Ser. No. 393,905
Claims priority, application Japan, Dec. 19, 1987, 62-320151
Int. Cl.[5] H02P *1/26*
U.S. Cl. 318—771 2 Claims

1. A spindle drive control apparatus for a machine tool, comprising:

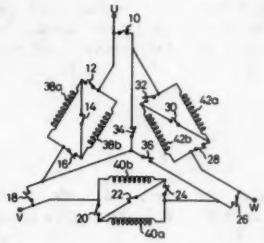
a rotational position detector which detects a rotational position of a spindle of the machine tool; and

a three-phase spindle motor which rotatingly drives said spindle of the machine tool, having

a pair of windings for each phase,

a terminal for said each phase for supplying power, and

a group of switch means including a first switch means for connecting each winding of said pair of windings for each phase in series, second switch means for connecting each winding of said pair of windings for each phase in parallel, third switch means for connecting said each pair of windings for each phase in a Δ connection when said second switch means is connecting each winding of said pair of windings in parallel, and fourth switch means for connecting said each pair of windings for



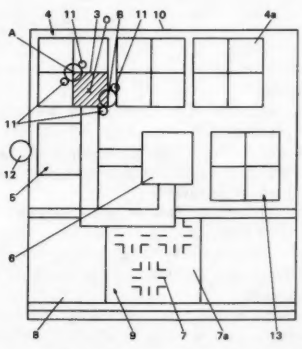
each phase in a Y connection when one of said first and second switch means is connecting each winding of said pair of windings in one of series and parallel.

5,068,588

APPARATUS FOR MOUNTING A FLAT PACKAGE TYPE IC

Hitoshi Kubota, Moriguchi; Manabu Yamane, Neyagawa, and Takashi Anezaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 19, 1989, Ser. No. 452,909
Claims priority, application Japan, Dec. 20, 1988, 63-321189
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—640 4 Claims



1. An apparatus for mounting a flat package type IC having leads on a printed circuit board having lands, comprising:

a holding means for holding the IC, said holding means being capable of moving at least in a horizontal plane and rotating about an axis;

a plurality of cameras each for taking an image of a part of the IC which are held by said holding means, and each for taking an image of a part of the board, said cameras being fixed to said holding means and arranged symmetrically with respect to said axis;

a first process means for obtaining linear deviation and rotational deviation for leads from said images of the IC, and for obtaining linear deviations and rotational deviation of lands from said images of the board;

a second process means for obtaining a linear difference between said linear deviations of the IC and board, and for obtaining a rotational difference between said rotational deviations of the IC and board; and

an adjusting means for adjusting the position of the IC held by said holding means, by linearly moving said holding means by said linear difference, and by rotating said hold-

ing means by said rotational difference, thereby correctly positioning the leads on the corresponding lands.

5,068,589

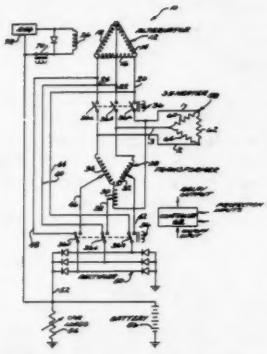
SUPPLEMENTAL AUTOMOTIVE VEHICULAR HEATER SYSTEM AND METHOD OF PROVIDING SAME

Stephen B. Offiler, Attleboro; Peter G. Berg, and Keith W. Kawate, both of Attleboro Falls, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 181,457, Apr. 14, 1988, which is a continuation of Ser. No. 69,665, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 852,484, Apr. 16, 1986, Pat. No. 4,678,982. This application Apr. 24, 1989, Ser. No. 342,054

Int. Cl.[5] B60L *1/02;* **H02J** *7/14*

U.S. Cl. 322—7 **2 Claims**



1. An electrical system for an automobile having an engine and a plurality of electrical loads comprising an alternator, the alternator having an alternator output means and having a field winding driven by the engine to provide electrical power to such loads, a voltage regulator for controlling the field winding energization, a battery for supplementing the electrical power provided by the alternator when needed and for turning over the engine upon start up, the alternator having a stator with three windings, the windings coupled together to provide a three phase voltage output on the alternator output means, a rectifier, the rectifier having input and output means, the rectifier output means connected to a circuit including the plurality of electrical loads, the battery and the voltage regulator, a three phase electrical resistance heater means, step-down transformer means having input and output means, switch means to selectively couple the alternator output means to the transformer input means and the heater means along with coupling the transformer output means to the rectifier input means and to couple the alternator output means to the rectifier input means bypassing the transformer means whereby the alternator is caused to produce a higher voltage when the transformer output means are coupled to the voltage regulator than when the transformer means is bypassed.

5,068,590

BRUSHLESS GENERATOR HAVING AC EXCITATION IN GENERATING AND STARTING MODES

Timothy F. Glennon, Rockford; Byron R. Mehl, Belvidere; Pierre Thollot, and Alexander Krinickas, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 20, 1989, Ser. No. 453,576

Int. Cl.[5] F02N *11/04;* **H02P** *9/06*

U.S. Cl. 322—10 **9 Claims**

1. An excitation system for a brushless generator having a main generator portion including a field winding disposed on a rotor and which receives field current and an armature winding disposed in a stator wherein the rotor is movable with respect to the stator and a permanent magnet generator (PMG) having an armature winding in which control power is developed wherein the generator is operable in a generating mode to convert motive power into electrical power and in a starting mode to convert electrical power provided to the main generator armature winding into motive power, comprising:

an exciter portion having a set of polyphase exciter field windings disposed in the stator and an armature winding disposed on the rotor and coupled to the main generator portion field winding;

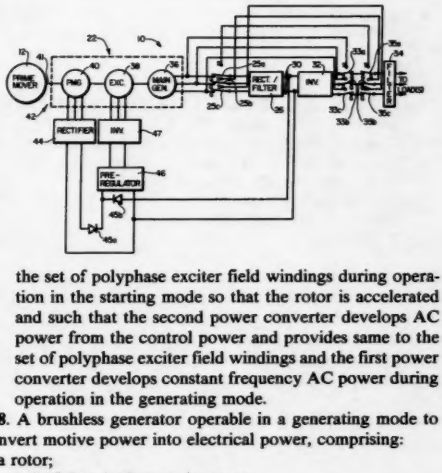
a source of electrical power;

a first power converter coupled to the main generator armature winding;

a second power converter coupled between the PMG armature winding and the set of polyphase exciter field windings;

means operable in the starting mode for coupling the source of electrical power to the first and second power converters and operable in the generating mode for disconnecting the source of electrical power from the first and second power converters; and

means coupled to the first and second power converters for controlling same such that the power converters provide AC power to the main generator armature winding and to



the set of polyphase exciter field windings during operation in the starting mode so that the rotor is accelerated and such that the second power converter develops AC power from the control power and provides same to the set of polyphase exciter field windings and the first power converter develops constant frequency AC power during operation in the generating mode.

8. A brushless generator operable in a generating mode to convert motive power into electrical power, comprising:

a rotor;

a main field winding on the rotor;

an exciter armature winding on the rotor, the exciter armature winding being electrically coupled to the main field winding;

a stator;

a main armature winding in the stator, the main armature winding being magnetically coupled to the main field winding on the rotor;

a set of exciter field windings magnetically coupled to the exciter armature winding; and

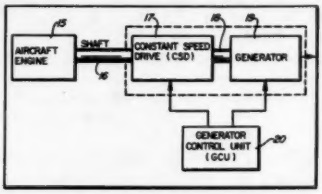
means for providing relatively low-frequency AC power to said exciter field windings when the generator is operating in the generating mode, said relatively low frequency being on the order of three Hz.

5,068,591

SPEED CONTROL FOR ELECTRICAL GENERATING SYSTEM

Lon Hoegberg, Loves Park, and Vijay Maddali, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 15, 1989, Ser. No. 436,612
Int. Cl.[5] H02P 9/42
U.S. Cl. 322—29 **19 Claims**



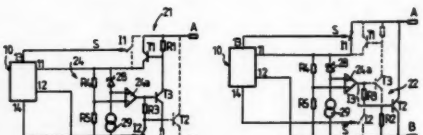
1. In an electrical generating system having
a variable speed prime mover,
a constant speed drive (CSD) with
a variable speed input connected to the prime mover,
a control input and
a constant speed output,
an AC generator connected with the CSD constant speed output and
a speed control including
a source of reference frequency,
means comparing the generator output frequency with the reference frequency to establish an error signal, and
means responsive to the error signal performing a proportional integration function to establish a CSD control signal,
the improvement comprising:
a lead/lag filter connected between the output of the proportional integration means and the CSD control input.

5,068,592

DETECTOR OF THE REGULATED VOLTAGE TWO WIRE TYPE

Didier Leonard, Hiersac, and Stephane Even, Angouleme, both of France, assignors to Telemecanique, France

Filed Dec. 26, 1990, Ser. No. 633,920
Claims priority, application France, Dec. 28, 1989, 89 17321
Int. Cl.[5] G05F 1/613, 3/16
U.S. Cl. 323—224 **5 Claims**



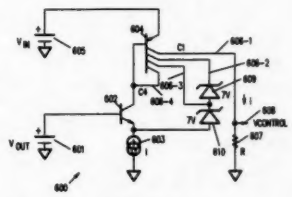
1. A two-wire detector device comprising:
i) a user circuit comprising a load in series with a DC or AC voltage source, said user circuit having first and second DC voltage terminals;
ii) controllable impedance switch means connected across said DC voltage terminals, said controllable impedance switch means having a closed state in which said load is in an ON state, and an open state in which said load is in an OFF state, said controllable impedance switch means having, in the closed state, an impedance variable as a function of a first control signal;
iii) a sensor having first and second supply terminals and first and second supply leads respectively connecting said first and second supply terminals to said first and second DC voltage terminals, said sensor further having an output terminal and delivering on said output terminal an output signal having first and second states;
iv) feedback regulator means for comparing the voltage across said supply terminals of the sensor to a reference voltage and generating on an output a regulation signal as a function of the difference between said voltages;
v) first control means for generating said first control signal from said regulation signal;
vi) a ballast component connected in series in said first supply lead, said ballast component having an impedance variable as a function of a second control signal and second control means for generating said second control signal from said regulation signal;
vii) switch means, controlled form said output signal of the sensor, for short-circuiting said ballast component and for closing said controllable impedance switch means when said output signal is in the first state and for enabling said ballast component and opening said controllable impedance switch means when said output signal is in the second state.

5,068,593

PIECE-WISE CURRENT SOURCE WHOSE OUTPUT FALLS AS CONTROL VOLTAGE RISES

Michael E. Wright, Berkeley, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Oct. 15, 1990, Ser. No. 597,830
Int. Cl.[5] G05F 3/26
U.S. Cl. 323—315 **20 Claims**



1. A current source comprising:
an input lead for receiving an input voltage;
an output lead for providing an output current;
a current mirror having an input lead coupled to receive an input signal in response to said input voltage, a plurality of control leads, and an output lead;
a plurality of output current control means, each coupled to a respective one of said control leads of said current mirror, each of said output current control means conducting current from said current mirror when said input voltage reaches a predetermined level associated with said output current control means, thereby affecting the current available on said output lead of said current mirror; and
a buffer having an input lead for receiving said input voltage and an output lead coupled to said input lead of said current mirror.

5,068,594

CONSTANT VOLTAGE POWER SUPPLY FOR A PLURALITY OF CONSTANT-CURRENT SOURCES

Yasumi Kurashima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 4, 1991, Ser. No. 664,371
Claims priority, application Japan, Mar. 2, 1990, 1-49218
Int. Cl.[5] G05F 3/16
U.S. Cl. 323—314 **9 Claims**

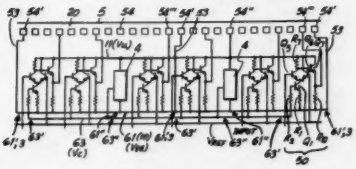
1. A semiconductor integrated circuit comprising:
a bus line having single or plural first nodes for supplying a

power source voltage to said bus line, and having single or plural second nodes;

single or plural constant-voltage circuits electrically connected to said single or plural second nodes of said bus line;

a plurality of constant-current sources arranged along said bus line and electrically connected to said bus line at their respective positions; and

a wiring electrically connecting said single or plural constant voltage circuits and said constant-current sources to supplying a constant voltage from said single or plural



constant voltage circuits to said constant-current sources to control the level of the constant current in said constant-current sources,

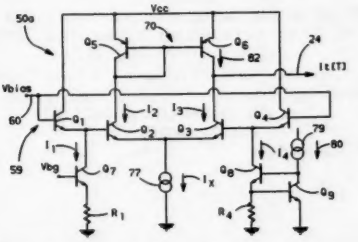
wherein, the positions of said first and second nodes of said bus line is determined such that the deviation of the level of said constant current among said constant-current sources becomes small, which deviation is caused by a voltage variation of said power source voltage at every portion of said bus line due to current flowing said bus line and by a voltage variation of said control voltage at every portion of said wiring due to current flowing said wiring.

5,068,595

ADJUSTABLE TEMPERATURE DEPENDENT CURRENT GENERATOR

Mark B. Kearney, Kokomo; Dennis M. Koglin, Indianapolis, and Jeffrey A. Michael, Bloomington, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Sep. 20, 1990, Ser. No. 585,587
Int. Cl.[5] G05F *3/16*
U.S. Cl. 323—316 **10 Claims**



1. A current generator for supplying an output current with adjustable temperature dependence, comprising:

a first circuit including (1) a transconductance current multiplier comprising four transistors, Q_1, Q_2, Q_3, and Q_4, the four transistors in part defining four primary current paths through with four primary currents, I_1, I_2, I_3, and I_4, flow (2) a current mirror comprising transistors Q_5 and Q_6 coupled to the transconductance current multiplier, transistor Q_5 connected to transistor Q_2 and transistor Q_6 connector to transistor Q_3, and (3) an output current path, coupled to the connection of transistor Q_3 to transistor Q_6, through which the output current, I_t, flows, the output current substantially bearing a relation to the two primary currents I_1 and I_4 such that:

$$I_t = G_c(I_4 - I_1)/(I_1 + I_4),$$

where G_c is a constant;

first means for generating current I_1 as a function of temperature;

second means for generating current I_4 as a function of temperature, wherein the first and second current generating means produce equal and opposite changes in I_1 and I_4 such that currents I_1 and I_4 bear a relationship to temperature of:

$$(I_4 - I_1)/(I_1 + I_4) = K(T - T_o),$$

where, K is a constant, T_o is an arbitrary temperature and T is a measure of the current generator temperature; and

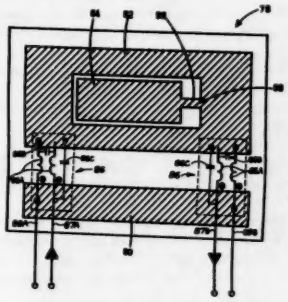
means for controlling currents I_2 and I_3 independent of temperature such that G_c is adjusted independent of temperature whereby the current generator has an adjustable gain, G_c.

5,068,596

INTERNAL GROUNDING ARRANGEMENT IN A SWITCHING POWER CONVERTER

George A. Banura, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 518,621, May 3, 1990, Pat. No. 5,023,542, which is a division of Ser. No. 389,245, Aug. 3, 1989, Pat. No. 4,961,048. This application Nov. 19, 1990, Ser. No. 618,323
Int. Cl.[5] H02M *3/155*
U.S. Cl. 323—351 **1 Claim**



1. An internal grounding arrangement for a switching DC/DC converter section of a power converter unit having at least one input/output component, at least one high current switching component, and at least one low current switching component, said internal grounding arrangement comprising:

a first ground plane for connection to an input-output component;

a second ground plane separate from said first ground plane for connection to a high current switching component;

a third plane separate from said first and second ground planes for connection to a low current switching component;

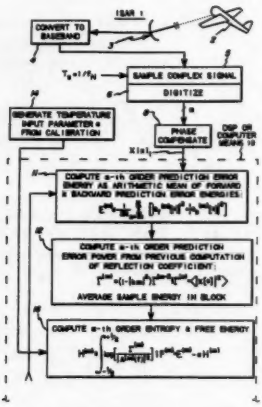
first means including a plurality of RF chokes interconnecting said first and second ground planes to permit transmission of DC energy but prevent transmission of RF energy therebetween; and

second means including a single conductor wire interconnecting said second and third ground planes at a single point of contact therebetween to permit operation of a low current switching component, upon connection to said second ground plane, with minimum interaction with a high current switching component, upon connection to said third ground plane.

5,068,597
SPECTRAL ESTIMATION UTILIZING A MINIMUM FREE ENERGY METHOD WITH RECURSIVE REFLECTION COEFFICIENTS

Seth D. Silverstein, and Joseph M. Pimbley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1989, Ser. No. 428,809
Int. Cl.[5] G01R *23/16*
U.S. Cl. 324—77 B **1 Claim**


ISAR 1
CONVERT TO BASEBAND
SAMPLE COMPLEX SIGNAL
DIGITIZE
GENERATE TEMPERATURE INPUT PARAMETER α FROM CALIBRATION
PHASE COMPENSATE
DSP OR COMPUTER MEANS 10
COMPUTE m-th ORDER PREDICTION ERROR ENERGY AS ARITHMETIC MEAN OF FORWARD & BACKWARD PREDICTION ERROR ENERGIES
COMPUTE m-th ORDER PREDICTION ERROR POWER FROM PREVIOUS COMPUTATION OF REFLECTION COEFFICIENT:
AVERAGE SAMPLE ENERGY IN BLOCK
COMPUTE m-th ORDER ENTROPY & FREE ENERGY

1. A method for rapidly estimating power spectral density components $\rho(f)$ in the spectrum of an input signal x(t), where said spectral components identify an object comprising the steps of:

(a) digitizing the input signal, with a selected sample rate, to provide a sampled input signal $X[n]_i$;

(b) computing an m-th order prediction error power as an arithmetic mean of forward and backward prediction error powers of the sampled input signal;

(c) computing a reflection coefficient $\Gamma^{(m)}$;

(d) computing, using $\Gamma^{(m)}$, an m-th order pediction error power;

(e) generating a control parameter α;

(f) using the parameters α and Γ, computing an m-th order entropy H and free power F of the sampled input signal;

(g) computing m-th order reflection coefficients as extremum of the m-th order free power.

(h) testing the computed extremum for proper order;

(i) if proper order is not found, generating a new (m+1)-st order solution for feedback to step (b);

(j) if proper order is found, generating power spectral density components $\rho(f)$; and

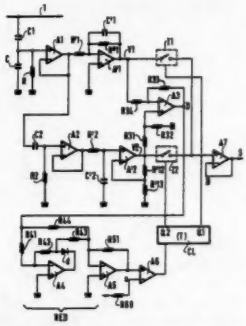
(k) recording the spectral components $\rho(f)$ thus generated as estimates of the input signal, where said object is identified by said spectral components.

5,068,598
TENSION POTENTIAL MEASURING CIRCUIT WITH SELECTED TIME CONSTANT

Jean-Paul Moncorge, Vaux en Velin, France, assignor to GEC Alsthom SA, Paris, France

Filed Dec. 3, 1990, Ser. No. 620,798
Claims priority, application France, Dec. 7, 1989, 89 16189
Int. Cl.[5] G01R *19/00*
U.S. Cl. 324—107 **5 Claims**

1. A circuit for measuring the tension of an electricity line, the circuit comprising, for each phase of the line: a capacitive tension divider comprising a first capacitor connected to the line and in series with a second capacitor connected to ground; and first and second amplification lines for amplifying the tension across the terminal of the second capacitor, said first amplification line having a time constant of the order of 100 ms and being associated with a phase correcting circuit, said second amplification line having a time constant of 2.5 ms to 15 ms; wherein the first and second amplification lines are connected to a common output via respective first and second switches controllable by a logic circuit, the tension measuring circuit further including a circuit for generating a signal representative of the absolute value of the algebraic difference

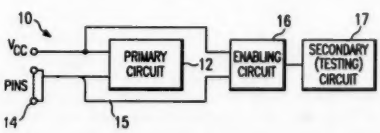


between the respective signals provided by the first and second amplification lines, a comparator circuit receiving said signal and providing at its output a control signal for said logic circuit causing it to operate when said absolute value exceeds a given threshold, said logic circuit being connected to keep the first switch closed and the second switch open so long as said absolute value is less than said threshold, and to open the first switch and to close the second switch when said absolute value exceeds the threshold.

5,068,599
INTEGRATED CIRCUIT HAVING AN ENABLING CIRCUIT FOR CONTROLLING PRIMARY AND SECONDARY SUBCIRCUITS

Jeffrey A. Niehaus, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 23, 1989, Ser. No. 425,787
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 R **27 Claims**



1. An integrated circuit including a primary circuit and a secondary circuit, said integrated circuit further comprising:

(a) a first pin coupled to said integrated circuit; and

(b) enabling circuitry coupled to said first pin, said enabling circuitry, coupling said first pin to said primary circuit responsive to a predetermined first signal on said first pin and coupling said first pin to said secondary circuit responsive to a second predetermined signal different from said predetermined first signal on said first pin.

5,068,600

TESTING DEVICE FOR BOTH-SIDED TWO-STAGE CONTACTING OF EQUIPPED PRINTED CIRCUIT BOARDS

Wolfgang Hilz, Munich; Rudolf Schuster, Heimstetten, and Hans Schauflinger, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

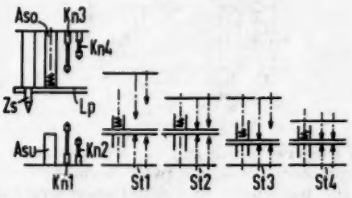
Continuation of Ser. No. 82,584, Aug. 7, 1987, abandoned. This application May 23, 1990, Ser. No. 528,340

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626758

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[5] G01R *1/04*

U.S. Cl. 324—158 F **11 Claims**



9. A testing device for a two-sided component equipped printed circuit board, comprising:

means for holding a twosided component equipped printed circuit board kin a predetermined centered position; and

means for selectively contacting the printed circuit board with a plurality of electrical contacts in at least three contact stages for electrical testing of the circuit board;

said means for selectively contacting including,

a lower needle adaptor having first and second resiliently mounted contact needles arranged test-specimen-associated, said first contact needles being mounted to extend a different distance than said second contact needles when in a relaxed condition,

an upper needle adaptor having third and fourth resiliently mounted contact needles arranged test-specimen-associated, said third contact needles being mounted to extend a different distance than said fourth contact needles when in a relaxed condition,

lower pressure rams associated with said lower needle adaptor and arranged test-specimen-associated, said lower pressure rams having at least a first and second position wherein said first position holds the printed circuit board pressed there against in contact with said first contact needles and out of contact with said second contact needles, and said second position holds the printed circuit board pressed there against in contact with both said first and second contact needles, and

upper pressure rams associated with said upper needle adaptor and arranged test-specimen-associated, said upper pressure rams having at least two positions.

5,068,601

DUAL FUNCTION CAM-RING SYSTEM FOR DUT BOARD PARALLEL ELECTRICAL INTER-CONNECTION AND PROBER/HANDLER DOCKING

Ronald D. Parmenter, Aloha, Oreg., assignor to Credence Systems Corporation, Fremont, Calif.

Filed Feb. 11, 1991, Ser. No. 654,264

Int. Cl.[5] G01R *31/02*

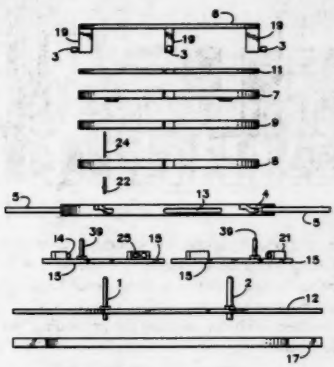
U.S. Cl. 324—158 F **10 Claims**

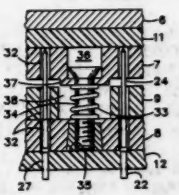
1. A DUT board mounting system for a semiconductor tester comprising:

a load board having a parallel electrical connection interface and at least two guide pins;

a cam-ring rotatably mounted on the load board, the cam-ring having a handle and a plurality of primary cams disposed around the cam-ring; and

a DUT board holddown ring having a plurality of cam followers, so that after a DUT board and the DUT board holddown ring have been aligned by the guide pins in





position atop the load board, rotation of the handle on the cam-ring causes rotation of the cam-ring producing an interaction of the plurality of cam followers with the plurality of primary cams on the cam-ring to draw the DUT board toward the load board and thereby bring a parallel electrical connection surface on the DUT board into electrical contact with the parallel electrical connection interface on the load board.

5,068,602

DUT BOARD FOR A SEMICONDUCTOR DEVICE TESTER HAVING A RECONFIGURABLE COAXIAL INTERCONNECT GRID AND METHOD OF USING SAME

Joseph A. Mielke, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 7, 1990, Ser. No. 579,423

Int. Cl.[5] G01R *1/06, 19/00*

U.S. Cl. 324—158 F **22 Claims**

1. A device-under-test board for a semiconductor device tester comprising:

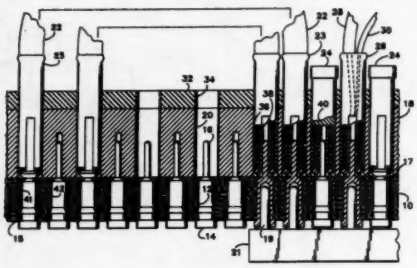
a circuit board containing a plurality of conductive paths comprising signal paths and a ground path;

an inner array of conductive members disposed within the circuit board, with a first end of the conductive members oriented toward a first surface of the circuit board and arranged to engage the contacts of a semiconductor device, and with a second end of the conductive members oriented toward a second surface of the circuit board;

an outer array of conductive members disposed within the circuit board around the outside of the inner array of conductive members, with a first end of the conductive members oriented toward the first surface of the circuit board, and with the second end of the conductive members oriented toward the second surface of the circuit

board, and with each of the conductive members of the outer array being in electrical contact with one of the plurality of conductive paths;

a grounding block of conductive material defining inner and outer arrays of holes corresponding in location to the



inner and outer arrays of conductive members, the grounding block being adjacent to the second surface of the circuit board such that the holes each align with one of the conductive members; and

means for electrically connecting the grounding block to the ground path.

5,068,603

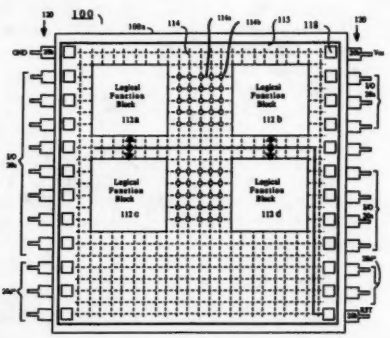
STRUCTURE AND METHOD FOR PRODUCING MASK-PROGRAMMED INTEGRATED CIRCUITS WHICH ARE PIN COMPATIBLE SUBSTITUTES FOR MEMORY-CONFIGURED LOGIC ARRAYS

John E. Mahoney, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 106,750, Oct. 7, 1987, Pat. No. 4,855,669. This application May 15, 1989, Ser. No. 351,888

Int. Cl.[5] G01R *1/00*

U.S. Cl. 324—158 R **14 Claims**



1. A mask-configured integrated circuit chip to be substituted for a user configured integrated circuit chip, the user configured integrated circuit chip having plural pass transistors each characterized by a first signal transmission delay, the mask-configured integrated circuit chip being pin compatible with the user configured integrated circuit chip and comprising:

plural mask-configured routing lines for routing signals previously routed by the pass transistors of the user configured integrated circuit chip, each of the mask-configured routing lines being characterized by one or more segments having second signal transmission delays approximately equal, within an order of magnitude, to the first signal transmission delay.

5,068,604

METHOD OF AND DEVICE FOR TESTING MULTIPLE POWER SUPPLY CONNECTIONS OF AN INTEGRATED CIRCUIT ON A PRINTED CIRCUIT BOARD

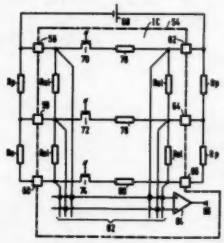
Dirk Van de Lagemaat, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1989, Ser. No. 368,748

Claims priority, application Netherlands, Jul. 20, 1988, 8801835

Int. Cl.[5] G01R *31/00, 31/02*

U.S. Cl. 324—158 R **22 Claims**



1. An integrated circuit chip comprising: multiple power supply connections for at least two different supply voltages with at least two separate ones of said power supply connections carrying the same rated supply voltage, an on-chip test comparison circuit having input terminals coupled to respective test leads, a selection mechanism coupled between the supply connections and the test comparison circuit via said respective test leads in order to selectively and sequentially connect only power supply connections associated with the same supply voltage to respective input terminals of the test comparison circuit thereby to produce, in a test state of the integrated circuit an error signal on a signal output of the test comparison circuit when a voltage deviation from a standard voltage difference across said power supply connections exceeds a critical value.

5,068,605

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND METHOD OF TESTING THE SAME

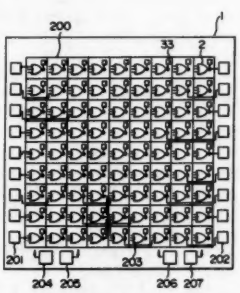
Moritoshi Yasunaga, Kawaguchi; Noboru Masuda, Kokubunji; Hideo Todokoro, Tokyo; Yasunari Umemoto, Tokorozawa; Hirotoshi Tanaka, Yamanashi, and Hiroyuki Itoh, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 404,355

Claims priority, application Japan, Sep. 7, 1988, 63-222315

Int. Cl.[5] G01R *31/28;* **G06F** *11/00*

U.S. Cl. 324—158 R **31 Claims**



1. A semiconductor integrated circuit device comprising:

input terminals;

output terminals;

a group of gates which receives an input signal applied to

said input terminals and which outputs an output signal from said output terminals, said output signal corresponding to the state of said input signal; and

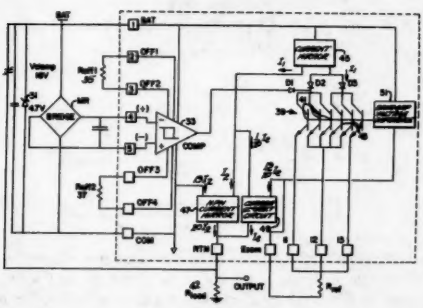
means for simultaneously setting outputs of at least a plurality of gates of said group either at a "1" level or at a "0" level by forcibly setting a transistor included in each gate in either an "on" state or an "off" state irrespective of the state of said input signal applied to said input terminals and the state of an input signal applied to each gate to indicate whether any faulty gates are present in said group of gates.

5,068,606

TWO WIRE MODULATED OUTPUT CURRENT CIRCUIT FOR USE WITH A MAGNETORESISTIVE BRIDGE SPEED/POSITION SENSOR

Keith W. Kawate, 12 Virginia Ave., Attleboro Falls, Mass. 02763; James P. Berthold, 32 State St., B12, Attleboro, Mass. 02703, and Robert M. Margolis, 265 Upland Ave., Newton, Mass. 02161

Filed Sep. 19, 1989, Ser. No. 409,220
Int. Cl.[5] G01P *3/488;* G01B *7/30;* G05F *3/26;* H03K *17/90*
U.S. Cl. 324—174 5 Claims



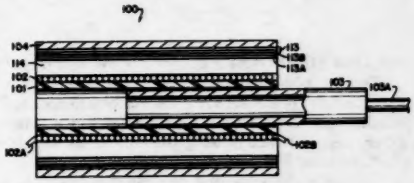
1. A two wire circuit to provide a modulated output current dependent upon the level of output voltage of a magnetoresistive transducer bridge comprising a magnetoresistive transducer bridge having an output voltage level dependent upon a condition, a voltage source coupled to the bridge, a voltage comparator coupled to the output of the bridge, the comparator having a high or low voltage output depending upon the output voltage level of the bridge, bandgap current source means comprising first and second pluralities of transistors, PNP current mirror means having a first output leg coupled to the first and second pluralities of transistors through first and second diodes respectively, the current mirror means having a second output leg coupled to a first input of an NPN current mirror, the NPN current mirror having a second input coupled to the comparator to draw current from the comparator, the NPN current mirror having an output connected to a load resistor in turn connected to ground, the comparator output connected through a third diode to a point intermediate the first plurality of transistors and the first diode so that when the comparator has a high voltage output the third diode is forward biased and the first diode is reversed biased and when the comparator has a low voltage output the third diode is reverse biased and the first diode is forward biased.

5,068,607

ELECTRICAL LINEAR POSITION TRANSDUCER WITH SILICON STEEL FOIL SHIELD SURROUNDING TRANSDUCER COIL

Robert W. Redlich, Athens, Ohio, and Douglas Bliss, Leominster, Mass., assignors to Data Instruments, Inc., Acton, Mass.

Filed Jun. 22, 1990, Ser. No. 542,152
Int. Cl.[5] G01B *7/14;* G08C *19/08*
U.S. Cl. 324—207.16 26 Claims



1. A linear position transducer for use in an electrical linear position measurement circuit comprising:

(a) a tube of electrically insulating material having a length at least substantially four times its outside diameter;

(b) a helical, electrically conductive coil wound around said tube and being at least substantially four of said outside diameters long, the ends of said coil being adapted for connection to said circuit so as to be energizable by said circuit;

(c) an elongated core of electrically conducting, non-ferromagnetic material having a first position adjacent one of its ends matingly received within, and slidable in axial reciprocation within, said tube, and a second portion adjacent its other end extending axially outwardly from said tube, said other end adapted to engage a workpiece;

(d) at least one layer of a selected material having a high magnetic permeability surrounding said coil and being at least substantially four of said diameters long; and,

(e) an electrically insulating material covering at least the outer side of said at least one layer of said selected material;

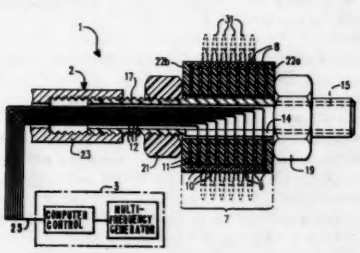
whereby axial movement of said core in said tube in response to changes in the linear position of said workpiece creates changes in the inductance of said coil which may be detected by said circuit.

5,068,608

MULTIPLE COIL EDDY CURRENT PROBE SYSTEM AND METHOD FOR DETERMINING THE LENGTH OF A DISCONTINUITY

William G. Clark, Jr., Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1989, Ser. No. 429,106
Int. Cl.[5] G01N *27/90*
U.S. Cl. 324—220 19 Claims



19. A system for determining the length of a discontinuity in a tube, comprising an elongated probe assembly including a stacked, linear array of eddy current coils separated by known distances along the longitudinal axis of said probe assembly,

wherein the axes of rotation of the coils are mutually colinear, and magnetic shield insulators between adjacent coils to prevent cross-talk therebetween, and an eddy current coil actuating means for separately, independently and sequentially conducting alternating current through said coils in said array to incrementally adjust the length of the electromagnetic sensing field along the longitudinal axis of said probe such that the length of discontinuity located between coils is determined by the known distances between the coils without the need for moving the probe assembly with respect to the discontinuity.

5,068,609

METHOD FOR GENERATING AN IMAGE USING NUCLEAR MAGNETIC RESONANCE SIGNALS

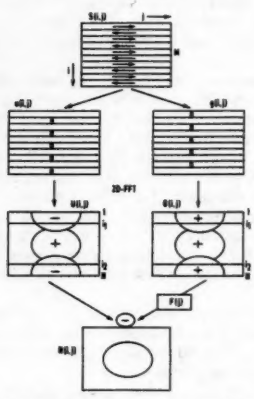
Herbert Bruder, Hemhofen; Hubertus Fischer, Erlangen; Franz Schmitt, Baiersdorf, and Hans-Erich Reinfelder, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 16, 1990, Ser. No. 524,344

Claims priority, application European Pat. Off., May 16, 1989, 89108772

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **4 Claims**



1. A method for generating an image of an examination subject using nuclear magnetic resonance signals, said method comprising the steps of:

disposing said examination subject in a fundamental magnetic field;

subjecting the examination subject to RF pulses to induce nuclear magnetic resonance signals in said examination subject;

generating first and second gradient magnetic fields, at least one of which is substantially periodic and a selected portion of said substantially periodic gradient magnetic field defining a scan;

reading out said nuclear magnetic resonance signals in said patient in the presence of said first and second gradient magnetic fields;

entering the samples obtained during a scan in one row of a measurement matrix, said measurement matrix having a number of columns corresponding to the number of scans;

dividing said measurement matrix into a first sub-matrix and a second sub-matrix, said first sub-matrix containing only even-numbered rows of the measurement matrix with intervening rows set to zero and the second sub-matrix containing only the odd-numbered rows of the measurement matrix with intervening rows set to zero;

subjecting said first and second sub-matrices to a Fourier transformation at least in the column direction to obtain a first intermediate image matrix U having entries U(i,j) and a second intermediate image matrix G having entries G(i,j), wherein i is a row number between 1 and N and j is a column number;

multiplying one of said intermediate image matrices by a factor F(j) calculated from edge rows i=1 through i_1 and $i=i_2$ through N of the intermediate image matrices according to the following equation:

$$F(j) = -\left[\frac{\sum_{i=1}^{i_1} U(i,j) \times G(i,j)^*}{\sum_{i=1}^{i_1} G(i,j) \times G(i,j)^*} + \frac{\sum_{i=N}^{i_2} U(i,j) \times G(i,j)^*}{\sum_{i=N.}^{i_2} G(i,j) \times G(i,j)^*}\right]$$

wherein $G(i,j)^*$ is the complex conjugate of the intermediate image matrix entries G(i,j); and

adding the intermediate image matrix multiplied by the factor F(j) with the other intermediate image matrix.

5,068,610

MRI METHOD AND DEVICE FOR FAST DETERMINATION OF THE TRANSVERSE RELAXATION TIME CONSTANT T2

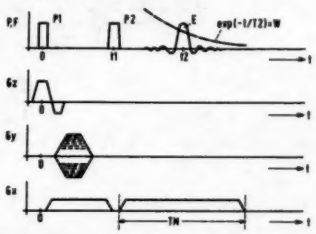
Antoon F. Mehlkopf, and Willem M. Prins, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1989, Ser. No. 358,327

Claims priority, application Netherlands, Jul. 8, 1988, 8801731

Int. Cl.[5] G01R *33/54*

U.S. Cl. 324—312 **21 Claims**



1. A method of obtaining images of a nuclear magnetization distribution in a part of a body, in which nuclear spins are excited in the body by rf excitation pulses in respective measurement cycles in the presence of a steady magnetic field in order to generate each cycle a spin resonance echo signal centered at an echo time TE after a said rf excitation pulse, after which in each cycle the spin resonance signal is sampled in the presence of a magnetic field gradient which is superimposed on the steady magnetic field, after which measurement cycles the resonance signals thus sampled are converted into an image of said distribution by signal transformation, characterized in that the distribution of the transverse relaxation time constant is determined from the relative asymmetry of only the sampled spin resonance echo signals centered about echo time TE.

5,068,611

MEASURING PROCEDURE FOR THE ELIMINATION OF FAULTS FROM AN NMR SIGNAL BY COMPARING RF FIELD COMPONENTS SPINNING IN OPPOSITE DIRECTIONS

Matti Savelainen, Espoo, Finland, assignor to Instrumentarium Corp., Finland

Filed Oct. 31, 1989, Ser. No. 429,281

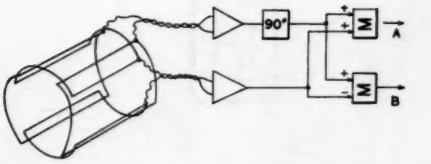
Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—314 **23 Claims**

1. A method for eliminating faults in an NMR signal of an

object, said NMR signal being derived from RF signals developed in at least a pair of RF coils, said RF signals including an RF signal component rotating in a given direction and developed as a result of the precession of the net magnetism of the sample about an axis of a polarizing magnetic field applied to the sample, and said RF signals including a component arising from faults, said method comprising the steps of:

simultaneously detecting components of the RF signals developed in the RF coils and rotating in opposite directions;



measuring the amplitude of the detected RF signal components;

utilizing the signal data so obtained to identify faults existing in the RF signal component produced by the net magnetism precession; and

eliminating the identified faults from the NMR signal derived from the RF signal component produced by the net magnetism precession.

5,068,612

ELECTROMAGNETIC SHIELD FOR AN INDUCTIVE SEARCH COIL ASSEMBLY

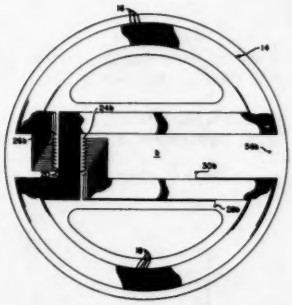
Klaus Auslander, Reutlingen; Hans-Jurgen Fabris, Pfulligen; Karl-Heinz Mock; Wolfgang Patwald, both of Reutlingen, and Helmut Seichter, Pfullingen, all of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Filed May 29, 1990, Ser. No. 530,020

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1989, 3920081

Int. Cl.[5] **G01V** *3/11;* **H01F** *15/04, 15/14;* **H05K** *9/00*

U.S. Cl. 324—327 **1 Claim**



1. A search coil assembly for an inductive search device having at least one search coil for producing a varying magnetic field in a search area and for having electrical signals induced in the search coil when an electrically conductive object is located in the search area, and a shield of electrically conductive material connected to a reference potential, comprising:

the shield includes an insulative carrier layer and a thin metal coating arranged thereupon, said metal coating being composed of a plurality of substantially parallel circuit tracks arranged on two opposite sides of the carrier layer extending partly in straight lines and partly in circular paths electrically connected to one another by connecting tracks to the reference potential, the distances between adjacent circuit tracks being substantially identical to the width of a circuit track;

the circuit tracks on the two sides of the carrier layer being staggered relative to one another such that a gap between each two adjacent circuit tracks on one side is opposed to a circuit track on the other carrier side.

5,068,613

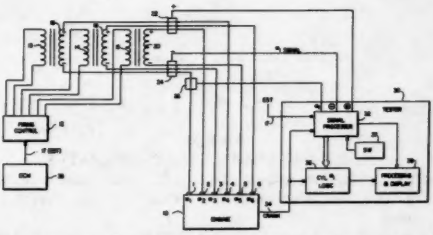
METHOD AND APPARATUS FOR GENERATING DISPLAY WAVEFORMS IM WASTED SPARK IGNITION SYSTEMS

Keith A. Kreft, Arlington Heights; Michael Dikopf, Palatine, and Thomas D. Loewe, Wonder Lake, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Continuation of Ser. No. 26,837, Mar. 17, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,168

Int. Cl.[5] **F02P** *17/00*

U.S. Cl. 324—379 **9 Claims**



1. A method of developing a stabilized firing event signal in a cylinder for a wasted spark ignition system wherein the spark plugs of a pair of complementary cylinders are fired simultaneously from opposite ends of an ignition coil secondary winding, comprising the steps of:

obtaining separate firing event signals from the spark plug ignition wires associated with the pair of cylinders;

sorting the firing event signals into first, power spark signals and second, wasted spark signals of like polarity;

combining the power spark signals and wasted spark signals together to eliminate common mode signal components therefrom; and

developing visual displays of power spark signals, wasted spark signals and combined power spark signals and wasted spark signals.

5,068,614

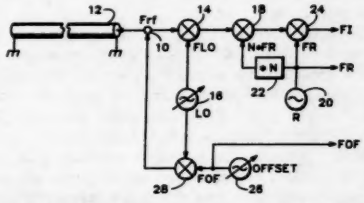
SWEPT FREQUENCY DOMAIN RELECTOMETRY ENHANCEMENT

Walter D. Fields, and Linley F. Gumm, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 5, 1990, Ser. No. 608,880

Int. Cl.[5] **G01R** *31/02*

U.S. Cl. 324—534 **5 Claims**



1. A method of locating a discontinuity in a cable under test

using a spectrum analyzer, the spectrum analyzer having an input/output terminal coupled to one end of the cable, comprising the steps of:

inserting a test signal into the cable;

receiving a return signal from the cable resulting from the test signal;

detecting a first maximum amplitude of an intermediate frequency obtained by mixing the return signal with a local oscillator and a reference signal;

varying the frequency of the test signal as a function of an offset frequency;

detecting a second maximum amplitude of the intermediate frequency resulting from the variation of the frequency of the test signal;

measuring the intermediate frequency at the first maximum value;

measuring the offset frequency at the second maximum value;

determining from the measured intermediate frequency and the measured offset frequency a distance to the discontinuity; and

displaying the distance to the discontinuity.

5,068,615

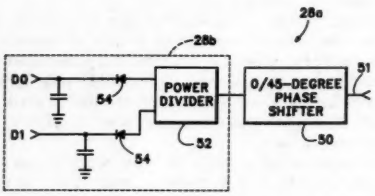
NOISE PARAMETER TEST APPARATUS

Eric W. Strid, Portland, and Bernard W. Leake, Beaverton, both of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Division of Ser. No. 262,463, Oct. 25, 1988, Pat. No. 4,998,071. This application Jun. 18, 1990, Ser. No. 539,732

Int. Cl.[5] G01R *27/28*

U.S. Cl. 324—613 **10 Claims**



1. In combination with a noise meter adapted to connect to a device under test to form a noise parameter system for testing the noise performance of said device under test, a one-port tuner comprising:

(a) a source port adapted to connect to said device under test;

(b) two termination admittance means for providing a plurality of predetermined admittances;

(c) two switching means for selecting one of said plurality of predetermined admittances, each of said switching means operatively associated with a respective one of said termination admittance means;

(d) a power divider having one input terminal and two output terminals, each of said output terminals connected to a respective one of said switching means; and

(e) a phase shifter means having two ports for selectively shifting the phase of signals passing therethrough by a predetermined amount, a first of said ports of said phase shifter connected to said input terminal of said power divider and a second of said ports of said phase shifter connected to said source port, said phase shifter selectable whether to shift phases by said predetermined amount.

5,068,616

MONITORING PROCESS AND DEVICE OF A QUASI-CLOSED ELECTROMAGNETIC SHIELD

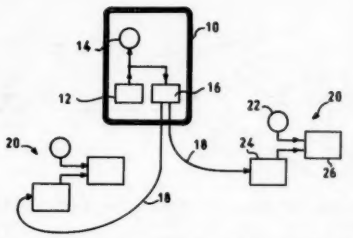
Frédéric Broyde, Rueil Malmaison, and Michel Barrault, Saint Ismier, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Aug. 1, 1989, Ser. No. 387,820

Claims priority, application France, Aug. 5, 1988, 88 10718

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—627 **8 Claims**



1. A method for measuring an effectiveness of quasi electromagnetic shield defining a volume enclosing electronic equipment, comprising the steps of:

generating from inside said shield a random or pseudo-random first signal of lower radio frequency electromagnetic radiation assimilated to a noise level and having a radio frequency between 1 and 100 KHz;

generating a second signal representative of said first signal;

providing a receiving means located outside said shield to receive said first and second signals;

propagating said first signal through said shield to said receiving means;

propagating said second signal through said shield, in a manner insensitive to said shield, to said receiving means;

synchronously receiving said first signal at said receiving means, in response to synchronicity information contained in said second signal; wherein said synchronous reception permits said propagated first signal to be distinguished from surrounding noise signals and said first signal is indicative of the effectiveness of said shield.

5,068,617

CAPACITY PROBE FOR LIQUID MEASUREMENTS

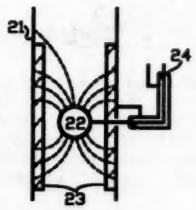
Stefan J. Reich, Ulrichstr. 68, D-8021 Icking, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 373,922

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822344

Int. Cl.[5] G01R *27/26*

U.S. Cl. 324—663 **2 Claims**



1. A system for measuring the dielectric of a liquid comprising:

a pair of capacitive electrodes for creating an alternating electric field in the liquid;

means responsive to the electrodes for detecting the electric field; and

isolating means in contact with the liquid for causing a narrowing or extension of the electric field between the electrodes, wherein the isolating means is positioned between the electrodes to cause a narrowing of the electric field by reducing the cross-sectional area of the electric field therebetween.

5,068,618

APPARATUS FOR MEASURING DIFFERENTIAL IMPEDANCES

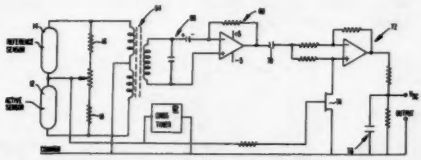
John J. Fry, Wickliffe, and Robert A. Smith, Mentor, both of Ohio, assignors to Elsag International B.V.

Continuation of Ser. No. 307,014, Feb. 6, 1989, abandoned, which is a continuation of Ser. No. 93,432, Sep. 4, 1987, Pat. No. 4,837,501. This application Aug. 15, 1990, Ser. No. 568,660

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] G01R *27/08*

U.S. Cl. 324—706 **4 Claims**



1. An improved system for measuring differential impedances comprising:

means for measuring a parameter representative of a specific operating condition; reference measuring means electrically connected to said parameter measuring means;

a CMOS timer for producing a square wave and being electrically connected to said parameter measuring means and said reference measuring means;

transformer means electrically connected to said parameter measuring means and said reference measuring means;

amplifier means electrically connected to said transformer means and signal converter means electrically connected to said amplifier means;

said signal converter means producing an output signal representative of the difference in current passing through said parameter measuring means and said reference measuring means said CMOS timer being electrically connected to said transformer means;

filter means electrically connected to the output of said transformer means and to the input of said amplifier means and

switch means electrically connected to said parameter measuring means and said reference measuring means.

5,068,619

CONDUCTIVITY MEASURING DEVICE

Shohkichi Nakano, Kawasaki, and Akira Matsushita, 12-5, Miyazaki 1-Chome, Miyamae-Ku, Kawasaki-Shi, Kanagawa-Ken, both of Japan, assignors to Nihon System Research Institute Inc. and Akira Matsushita, both of Kawasaki, Japan

Filed Oct. 25, 1988, Ser. No. 261,871

Claims priority, application Japan, Oct. 27, 1987, 62-271351

Int. Cl.[5] G01R *27/02*

U.S. Cl. 324—715 **8 Claims**

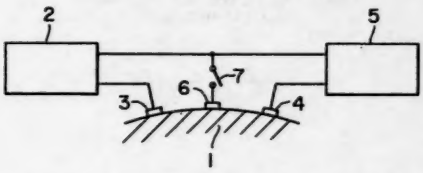
1. A conductivity measuring device for measuring the conductivity at the surface and at an inner portion of a body to be tested, comprising:

two measuring electrodes, including one transmitting electrode and one receiving electrode;

an intermediate electrode disposed between said measuring electrodes;

a circuit including a switch which connects the intermediate electrode to the receiving electrode, wherein the switch is changeable between two states,

said switch in its first state connecting the intermediate electrode to a low-potential, so that current in the inner portion of the body between the transmitting electrode and the receiving electrode is measured,



said switch in its second state being open to disconnect the intermediate electrode from the circuit so that a composite current in the body between the transmitting electrode and the receiving electrode in the body is measured.

5,068,620

CIRCUIT FOR SECURING OUTPUT DISTORTION, IN PARTICULAR OF FINAL STAGES OF AUDIO DEVICES

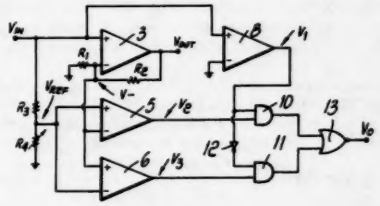
Edoardo Botti, Vigevano; Fabrizio Stefani, Cardano Al Campo, and Daniela Nebuloni, Bareggio, all of Italy, assignors to SGS-Thomson Mocroelectronics S.r.l., Agrate Brianza, Italy

Filed Nov. 1, 1990, Ser. No. 607,949

Claims priority, application Italy, Nov. 8, 1989, 22306 A/89

Int. Cl.[5] G01R *19/00*

U.S. Cl. 330—2 **4 Claims**



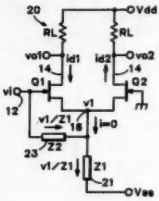
1. Circuit for sensing output distortion of amplifier stages, in particular of final stages of audio devices, said amplifier stage having a first input which receives a voltage signal to be amplified, a second input which is connected to a feedback network and an output which generates an amplified output signal, said circuit further comprising a voltage divider arranged between said first input and a reference voltage line, said voltage divider comprising at least one variable resistor and having an intermediate terminal which generates a first signal which is correlated to said voltage signal, and comparator means which receive in input said first signal and a second signal which is correlated to said output signal, said comparator means being suitable for generating a distortion signal when said second signal exceeds said first signal in terms of absolute value, said comparator means comprising at least one first comparator which is connected in input to said first input of said amplifier stage and to said reference voltage line and is suitable for generating an enable signal which is in step with said voltage signal, and a second comparator which is connected in input to said intermediate terminal of said divider and to the feedback network of said amplifier stage and is suitable for generating said distortion signal in output, said second comparator being enabled by said enable signal.

5,068,621

COMPENSATION METHOD AND APPARATUS FOR ENHANCING SINGLE ENDED TO DIFFERENTIAL CONVERSION

Wesley H. Hayward, and Stewart S. Taylor, both of Beaverton, Oreg., assignors to TriQuint Semiconductor, Inc., Beaverton, Oreg.

Filed Aug. 13, 1990, Ser. No. 566,904
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **35 Claims**



32. A method for converting an unbalanced differential current into a balanced differential current, the method comprising:

providing a differential stage having a single-ended voltage input, a differential current output, and a bias terminal;

coupling a first impedance to the bias terminal to supply bias current and an associated undesirable signal tail current to the differential stage; and

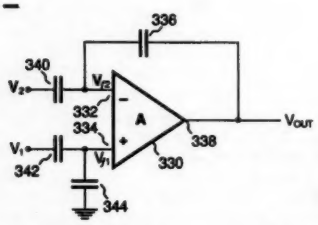
providing a compensating signal current to the bias terminal that is substantially equal to the signal tail current, thereby cancelling the signal tail current flowing through the differential stage and providing a balanced differential output current.

5,068,622

CMOS AMPLIFIER WITH OFFSET ADAPTATION

Carver A. Mead, Pasadena, and Timothy P. Allen, Los Gatos, both of Calif., assignors to Synaptics, Incorporated, San Jose, Calif.

Continuation-in-part of Ser. No. 282,176, Dec. 9, 1988, Pat. No. 4,935,702. This application Feb. 28, 1990, Ser. No. 486,336
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **4 Claims**



4. An adaptive analog MOS inverting amplifier fabricated as a part of an integrated circuit, said amplifier having a gain of magnitude much larger than 1, including:

an non-inverting input node,

an inverting input node,

an output node,

an amplifying element having a gain larger than 1, including an inverting input, a non-inverting input, and an output, said output connected to said output node,

a first floating node, connected to the inverting input of said amplifying element,

a first MOS capacitor having a first electrode connected to said inverting input node and a second electrode connected to said first floating node,

a second floating node, connected to the non-inverting input of said amplifying element,

a second MOS capacitor having a first electrode connected to said non-inverting input node and a second electrode connected to said second floating node,

a third MOS capacitor having a first electrode connected to said output node and a second electrode connected to said first floating node,

a fourth MOS capacitor having a first electrode connected to said second floating node and a second electrode connected to a source of fixed voltage,

the ratio of said third MOS capacitor to said first MOS capacitor being substantially equal to the ratio of said fourth MOS capacitor to said second MOS capacitor, and

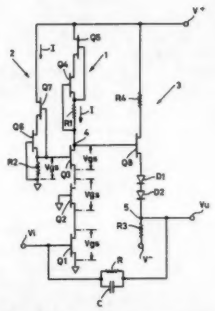
an opaque layer covering portions of the surface of said integrated circuit containing active circuits, said opaque layer having an aperture therein above said third capacitor for allowing ultraviolet light to fall onto said first and second electrodes of said third capacitor whereby the offset voltage of said adaptive amplifier can be adapted while a source of ultraviolet light is present.

5,068,623

HIGH-GAIN AMPLIFIER WITH LOW NOISE AND LOW POWER DISSIPATION, USING FIELD EFFECT TRANSISTORS

Daniel V. Camin, Milano; Gianluigi Pessina, Lainate, and Ezio Previtali, Curno, all of Italy, assignors to Istituto Nazionale Di Fisica Nucleare, Roma, Italy

Filed May 11, 1990, Ser. No. 521,998
Claims priority, application Italy, May 23, 1989, 20610 A/89
Int. Cl.[5] H03F *3/16*
U.S. Cl. 330—277 **3 Claims**



1. A high-gain amplifier comprising:

a first field effect transistor controlled by an input signal of the amplifier;

at least one second field effect transistor connected in cascade with said first transistor;

a first current generator for power supply of said first and second transistors;

a second current generator for biasing said first and second transistors so as to cause them to operate in respective linear regions of their characteristics;

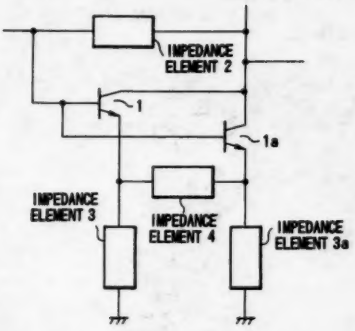
said first and second current generators being substantially equal to each other and including each a resistance and two serially connected field effect transistors having gate terminals respectively connected to opposite ends of said resistance so as to cause said two transistors to operate in respective linear regions of their characteristics.

5,068,624

AMPLIFIER

Yoshio Taneichi, and Yukinari Fujiwara, both of Tokyo, Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 579,377
Claims priority, application Japan, Sep. 11, 1989, 1-105360
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—293 3 Claims



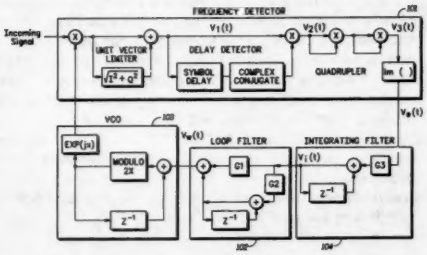
1. An amplifier using at least two transistors as amplifying elements, wherein first input electrodes and first output electrodes of said transistors are commonly connected, a first impedance element is connected between said first input electrodes and said first output electrodes, a second impedance element is connected between a second output electrode of each transistor and ground, and a third impedance element is connected between said second output electrodes.

5,068,625

METHOD FOR FAST FREQUENCY ACQUISITION IN A PHASE LOCKED LOOP

James C. Baker, Hanover Park, and Michael J. Carney, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1990, Ser. No. 627,171
Int. Cl.[5] H03L *7/085*
U.S. Cl. 331—1 A 6 Claims



1. A method for frequency acquisition in a phase locked loop having a phase error signal and a voltage controlled oscillator that outputs a variable frequency signal in response to a control voltage, the method comprising the steps of:

a) detecting a peak voltage, at a time t_p, for the phase error signal;

b) sampling the control voltage at the time t_p; and

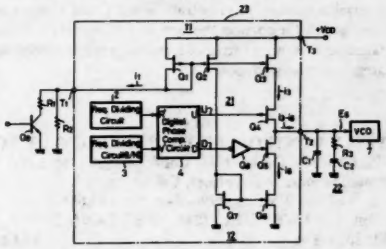
c) resetting the control voltage substantially equal to the sampled control voltage at the time t_p.

5,068,626

CHARGE PUMP CIRCUIT

Kotaro Takagi, Tokyo, and Satoshi Yokoya, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 538,187
Claims priority, application Japan, Jun. 27, 1989, 1-165113
Int. Cl.[5] H03L *7/00*
U.S. Cl. 331—17 11 Claims



1. A charge pump circuit for charging capacitive means in response to a phase difference between first and second input signals, comprising:

constant current source means for providing a first constant current;

constant current sinking means for absorbing a second constant current;

an output terminal adapted to be connected to a capacitive means;

switching means for providing said first constant current and said second constant current flowing in opposed directions through said output terminal to the capacitive means in response to said phase difference between said first and second input signals for selectively charging and discharging the capacitive means to produce a voltage level thereof corresponding to said phase difference; and

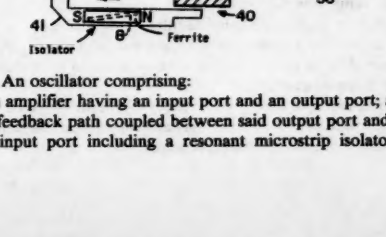
means for substantially equalizing the magnitudes of the first constant current provided by said constant current source means and the second constant current absorbed by said constant current sinking means so that a linear relationship exists between said phase difference between said first and second input signals and the resulting charging and discharging periods of the capacitive means.

5,068,627

NARROW BAND MICROSTRIP ISOLATOR

Richard W. Babbitt, Fair Haven; Adam Rachlin, Eatontown, and Thomas E. Koscica, Clark, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1990, Ser. No. 617,130
Int. Cl.[5] H03B *5/18*; H01P *1/365*
U.S. Cl. 331—99 14 Claims



8. An oscillator comprising:

an amplifier having an input port and an output port; and

a feedback path coupled between said output port and said input port including a resonant microstrip isolator ar-

ranged to pass microwaves from said output port to said input port, wherein the resonant microstrip isolator comprises a dielectric substrate, a conductive surface on one side of said dielectric substrate so as to form a ground plane, a top conductor on the opposite side of said substrate, the top conductor being narrower in width than said conductive surface so as to form a microstrip line, means forming an elongated slot in said top conductor that is at an angle with respect thereto, a strip of ferromagnetic material mounted in registration with said slot so as to cover at least a portion thereof, and means for producing magnetic flux in said strip of ferromagnetic material that is extends across said slot.

5,068,628

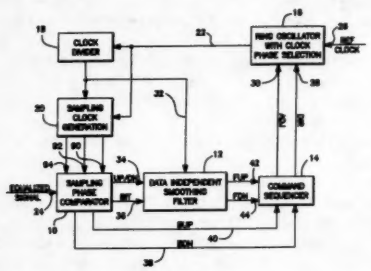
DIGITALLY CONTROLLED TIMING RECOVERY LOOP

Sajol C. Ghoshal, Orangeville, Calif., assignor to Level One Communications, Inc., Folsom, Calif.

Filed Nov. 13, 1990, Ser. No. 612,569

Int. Cl.[5] H03K *5/26;* **H03L** *7/087, 7/091, 7/093*

U.S. Cl. 331—1 A **23 Claims**



1. A timing recovery loop, comprising:

(a) oscillator means for generating an output clock;

(b) multi-point sampling phase comparator means, connected to the oscillator means, for sampling and comparing an amplitude of a pulse in an input signal at a plurality of points along the pulse and for generating at least one control signal indicating an amount and a direction of adjustment required to lock the output clock to the input signal; and

(c) data independent smoothing filter means, connected to both the phase comparator means and the oscillator means, for averaging the control signals indicating the amount and the direction of adjustment required to lock the output clock to the input signal, and for adjusting a frequency of the output clock by controlling the oscillator means in response to the averaged control signals so that the oscillator means, pull range is relatively independent of pulse density in the input signal.

13. A phase comparator for eliminating jitter on an input signal due to pulse position distortion, comprising:

(a) means for sampling an amplitude of a pulse in the input signal at a plurality of points along the pulse;

(b) means, connected to the means for sampling, for comparing the sampled amplitudes; and

(c) means, connected to the means for comparing, for adjusting a frequency of an output clock in accordance with the compared amplitudes so that the output clock is locked to the input signal.

20. A data independent digital filter, comprising:

(a) means for calculating a frequency adjustment for an output clock that is relatively independent of mark density in an input signal; and

(b) means for adjusting a frequency of the output clock by the calculated frequency adjustment so that the output clock is locked to the input signal.

5,068,629

NONRECIPROCAL CIRCUIT ELEMENT

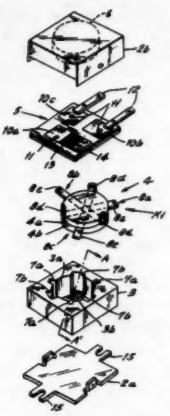
Toshio Nishikawa, Nagaokakyo; Takekazu Okada, Kyoto; Hiroki Dejima, Uji, and Hiromu Tokudera, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 445,913, Dec. 4, 1989, abandoned, which is a continuation of Ser. No. 254,459, Oct. 6, 1988, abandoned. This application May 2, 1990, Ser. No. 519,266

Claims priority, application Japan, Oct. 7, 1987, 62-253956; Aug. 25, 1988, 63-211200

Int. Cl.[5] H01P *1/36, 1/387*

U.S. Cl. 333—1.1 **22 Claims**



1. A nonreciprocal circuit element comprising:

a ferrite assembly which includes at least one ferrite member and a plurality of central conductors;

said central conductors being electrically insulated from each other while intersecting with one another in an axial direction of said ferrite assembly;

said central conductors each having a lead-out portion and an earthing portion; and

a dielectric substrate which has an earthing electrode formed on one face thereof and conductively connected to said at least one ferrite member, and has a plurality of impedance matching electrodes formed on the other face thereof;

said ferrite assembly and said dielectric substrate being stacked in said axial direction and substantially coextensive, in a radial direction, within an imaginary cylinder closely surrounding said ferrite assembly and said dielectric substrate, with said lead-out portions of said central conductors being, respectively, connected to said impedance matching electrodes and extending from said ferrite assembly to said impedance matching electrodes, said lead-out portions defining said imaginary cylinder;

said earthing portions of said central conductors and said earthing electrode of said dielectric substrate being grounded; and

magnetic means applying a direct current magnetic field to said ferrite assembly.

5,068,630

MULTIPLE COUPLER DEVICE WITH RETURN PATH

Joël Gris, Louviers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1989, Ser. No. 450,759

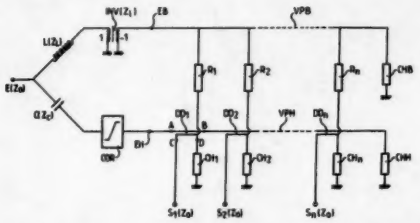
Claims priority, application France, Dec. 27, 1988, 88 17226; Dec. 27, 1988, 88 17228

Int. Cl.[5] H03H *7/48*

U.S. Cl. 333—100 **23 Claims**

1. A wideband multiple coupler device for use with signals

within a particular frequency range having an input and a plurality of outputs of the same characteristic impedance Z_0, constituted by a low-pass path comprising an impedance star distrubutor, and a high-pass path comprising a series arrangement of directional couplers, the outputs of these two paths being pair-wise dc connected to constitute said plurality of outputs, characterized in that the input of the impedance star distributor is connected to said input of the multiple coupler



device by means of a first input connection comprising an inductive impedance Z_1, in that the input of the cascade arrangement of directional couplers is connected to the input of the multiple coupler device by means of a second input connection comprising a capacitive impedance Z_c, in that one of the two input connections is also provided with a phase inverter element connected in series for restoring the phase of signals transmitted over the high-pass path and the low-pass path, throughout the frequency range, and in that $Z_1 \cdot Z_c = Z_0^2$.

5,068,631

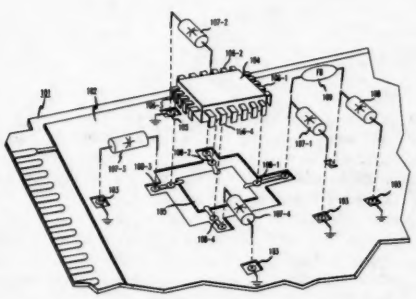
SUB POWER PLANE TO PROVIDE EMC FILTERING FOR VLSI DEVICES

Richard A. Vince, Newburyport, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 9, 1990, Ser. No. 564,998

Int. Cl.[5] H03H *7/00*; H05K *1/18*

U.S. Cl. 333—181 **11 Claims**



1. A circuit board having a prescribed surface comprising:

a ground system;

a main power distribution system being disposed in a prescribed planar relationship to the prescribed surface of the circuit board; and

at least one sub-power plane disposed in prescribed spatial relationship with a physically separate from said main power distribution system, said subpower plane being in the same planar relationship as said main power distribution system to the prescribed surface of the circuit board and being adapted to be connected to at least one VLSI device having multiple power input leads.

5,068,632

SEMI-RIGID CABLE DESIGNED FOR THE TRANSMISSION OF MICROWAVES

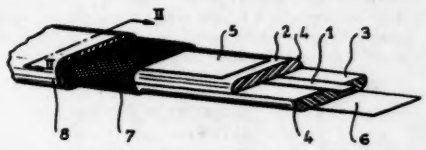
André Champeau, Orsay, France, assignor to Thomson-CSF, Puteaux, France

Filed Dec. 15, 1989, Ser. No. 451,821

Claims priority, application France, Dec. 20, 1988, 88 16811

Int. Cl.[5] H01P *3/08*

U.S. Cl. 333—238 **7 Claims**



1. A semi-rigid cable for transmission of microwave signals up to a pre-determined frequency comprising:

(a) a semi-rigid flat stripline having length, width, and thickness, and having

a central conductor (1)

two parallel metal strips (5, 6),

a dielectric (4) disposed between said conductor (1) and strips (5, 6),

said strips having a width (L_1), where

L_1 is approximately equal to one of either value NA and N, whichever value is greater, where

L_1=width of said strips,

A=width of said central conductor,

e=distance between said two parallel metal strip,

N≃; and

(b) a conductive shielding sheath (7) completely surrounding and enclosing said stripline.

5,068,633

AUTOMATIC CANCELING DEVICE FOR A WINKER

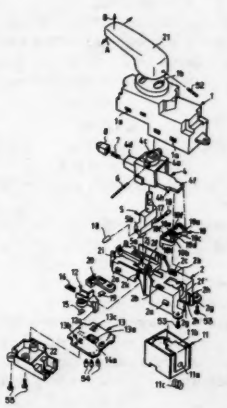
Takuya Maeda, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1990, Ser. No. 534,400

Claims priority, application Japan, Sep. 9, 1989, 1-105715[U]

Int. Cl.[5] H01H *3/00*

U.S. Cl. 335—190 **1 Claim**



1. An automatic canceling device for a winker comprising:

a case;

a holder mounted pivotably on said case;

a locking mechanism engaged with said holder for holding said holder at neutral, right, or left positions;

a solenoid disposed in said case and energized by an unlock signal, said solenoid having a working member;

a locking removing member disposed between said working member of said solenoid and said holder, and acting to return said holder towards said neutral position;

wherein said locking removing member includes an aperture having an engaging portion coupled to said working member, a first fulcrum portion disposed on one surface of said locking removing member and positioned for contacting said holder, and a second fulcrum portion disposed on another surface of said locking removing member;

said device comprising further a supporting portion which rotatably supports said second fulcrum portion, and positioned for contacting said second fulcrum portion.

5,068,634

OVERVOLTAGE PROTECTION DEVICE AND MATERIAL

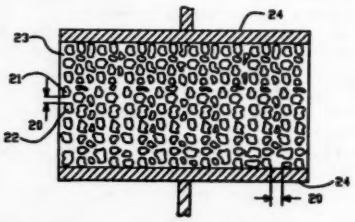
Karen P. Shrier, Half Moon Bay, Calif., assignor to Electromer Corporation, Belmont, Calif.

Continuation-in-part of Ser. No. 143,615, Jan. 11, 1988, Pat. No. 4,977,357. This application Aug. 8, 1989, Ser. No. 390,732

The portion of the term of this patent subsequent to Jan. 8, 2008 has been disclaimed.

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—21 **21 Claims**



1. An overvoltage protection material for placement between and in contact with spaced conductors, said material comprising a matrix formed of a binder and only closely spaced conductive particles:

a) said only closely spaced conductive particles homogeneously distributed in said binder, said particles being in the size range 10 microns to two hundred microns and spaced in the range 25 angstroms to 350 angstroms to provide electrical conduction by quantum-mechanical tunneling therebetween; and

b) said binder selected to provide the quantum-mechanical tunneling media between said particles and predetermined resistance between said conductive particles in the absence of quantum-mechanical tunneling.

5,068,635

STRESS SENSOR HAVING DEFORMABLE CERAMIC HOLLOW MEMBER

Yasuhito Yajima, Nagoya, Japan, assignor to NGK Insulators, LTD., Japan

Filed Jul. 20, 1989, Ser. No. 382,588

Claims priority, application Japan, Jul. 27, 1988, 63-187173

Int. Cl.[5] H01C *10/10*

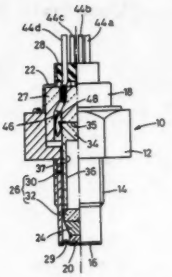
U.S. Cl. 338—42 **21 Claims**

9. A stress sensor comprising:

a ceramic member having an inner and an outer surface and a hollow portion defined by said inner surface, said ceramic member being deformable according to a stress applied thereto in a direction in which said hollow portion extends;

a pair of support members disposed at opposite ends of said ceramic member so as to support said ceramic member in said direction such that said stress is imparted to said ceramic member in said direction through one of said pair of support members;

at least one resistor provided on at least one of said inner surface and said outer surface, an electrical resistance value of said at least one resistor varying with an amount of deformation of said ceramic member, said stress being detected based on a change in said electrical resistance value of said at least one resistor; and



a temperature compensating member disposed at one end of said ceramic member, said stress being transferred from said temperature compensating member to said ceramic member such that a coefficient of thermal expansion of said temperature compensating member reduces an influence of a temperature variation of the sensor on an output of the sensor.

5,068,636

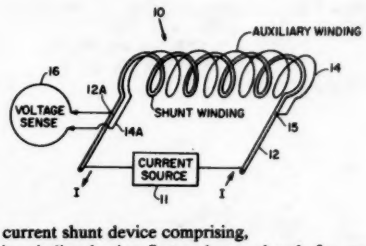
CURRENT SHUNTING

George A. Cavigelli, Lexington, Mass., assignor to Doble Engineering Company, Watertown, Mass.

Filed Oct. 26, 1989, Ser. No. 427,447

Int. Cl.[5] H01C *7/00*

U.S. Cl. 338—49 **16 Claims**



1. A current shunt device comprising,

a main winding having first and second ends for carrying current to be sensed,

an auxiliary winding having first and second ends and being coextensive with said main winding,

said second ends being connected together,

whereby the potential between said first ends is representative of said current to be sensed substantially independent of voltages induced in said windings by stray magnetic fields.

5,068,637

PLATE-LIKE METAL ELEMENT FOR ELECTRICAL RESISTOR GRID ASSEMBLY

Eric W. Bayer, North East, Pa., assignor to General Electric Company, Erie, Pa.

Filed Feb. 8, 1990, Ser. No. 476,856

Int. Cl.[5] H01C *1/08, 3/00, 7/22, 1/01*

U.S. Cl. 338—57 **33 Claims**

1. A resistor grid assembly comprising:

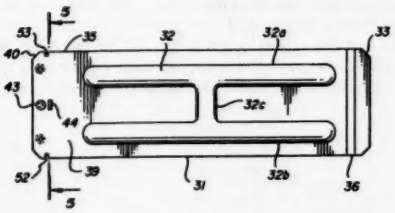
a plurality of generally parallel, plate-like, electrically conductive elements, each element having only one off-set

end, and being disposed between first and second spaced-apart support members of electrically non-conductive material and aligned, respectively, with a plurality of slotted openings in the opposing sidewalls of the support members, adjacent elements in the assembly being oppositely oriented and the first segment of each element being welded to the second segment of the next element; the plurality of electrically conductive elements each comprising:

a. a relatively thin, substantially rectangular, plate-like metal body having a predetermined width;

b. first and second metal segments at opposite ends of the body, each of the segments being integral with and having substantially the same width as said body, the second segment being coplanar with the body;

c. each element being bent at the juncture of the first segment and the body, to form a first portion generally coplanar with the body and a second portion connecting the first portion with the body, the first segment of each element being adapted to be welded to the surface of the second segment of another element after two such elements are placed side by side with opposite



orientation so that the first segment of one adjoins the second segment of the other;

d. a metal border segment, contiguous and generally coplanar with the second segment and having substantially the same width and gauge as the second segment, for entering a slotted opening in the sidewall of one of the first and second support members of the resistor grid assembly, the border segments of alternate elements in the assembly being respectively receivable by the slotted openings in the first support member, and the border segments of the oppositely oriented elements between said alternate elements being respectively receivable by the slotted openings in the second support member such that adjacent elements are supported by their respective border segments when installed in the assembly; and

e. at least one protuberance formed in the border segment, forming a physical stop for locating the distal end of the first segment of the adjacent element in a desired lengthwise position when two such elements are placed side-by-side with opposite orientation such that the second segment of one element can be operatively connected to the adjoining first segment of the other element.

5,068,638

ELECTRICAL SENSING ELEMENT

Alan C. Bickely, Sawtry Huntingdon, England, and Travis Moore, Dumfries, Scotland, assignors to The Gates Rubber Company, Denver, Colo.

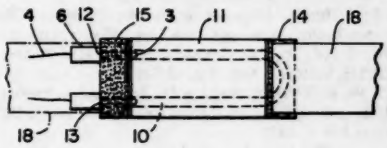
Filed Sep. 11, 1989, Ser. No. 405,484

Claims priority, application United Kingdom, Sep. 14, 1988, 8821539

Int. Cl.[5] H01C *10/10*

U.S. Cl. 338—114 **12 Claims**

1. A sensing element comprising a continuous, extruded tubular body of pressure sensitive electrically conductive material formed by a non-conductive matrix of flexible elastomeric material, the matrix containing electrically conductive particles and said tubular body having opposite open ends; and holding means holding said tubular body at two spaced locations thereof so that said tubular body is capable of axial elongation and contraction between said spaced locations, each of



said open ends being exposed and forming a connection region into which an electrical connector may be inserted as a push fit.

5,068,639

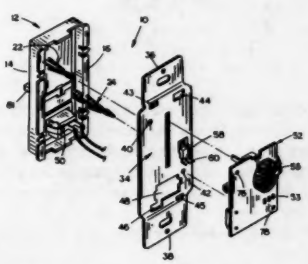
WALL BOX DIMMER

Dall L. Swanson, Danville, Ill.; Raymond M. Green, Richardson, Tex., and Gregory S. Bennorth, Champaign, Ill., assignors to Valmont Industries, Inc., Valley, Nebr.

Filed Jun. 25, 1990, Ser. No. 543,448

Int. Cl.[5] H01C *10/38*

U.S. Cl. 338—179 **6 Claims**



1. A wall box dimmer comprising,

a face plate having front and rear surfaces, upper and lower ends, and opposite side edges,

said face plate having at least a pair of stand-offs extending rearwardly from the rear surface thereof,

a substantially flat mounting strap positioned rearwardly of said rear surface of said face plate and having upper and lower ends positioned above the upper and lower ends of said face plate, respectively,

said mounting strap having a pair of openings formed therein which receive said stand-offs,

said stand-offs including resilient arms diverging outwardly and forwardly, and having forward free ends, which are deflected towards one another as the standoffs are inserted through the respective openings in the mounting strap, and which move outwardly when inserted past their forward ends through said mounting strap openings for maintaining said mounting strap closely adjacent the reaf surface of said face plate,

a circuit board means mounted on said stand-offs rearwardly of said mounting strap and in a fixed and spaced relationship with respect thereto,

a rheostat means on said circuit board means includes a slide means,

said mounting strap having a slot formed therein through which said rheostat slide means projects for slidable movement;

a dimmer knob movably mounted on said face plate and having a slide arm extending rearwardly therefrom which is operatively connected to the rheostat slide means for selective movement of the same,

and an on-off switch means mounted on said face plate.

5,068,640

METHOD OF OPERATING A SAFETY DEVICE FOR VEHICLE OCCUPANTS

Wilfried Burger, Hemmingen; Werner Nitschke, Ditzingen; Peter Taufer, Renningen, and Hugo Weller, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

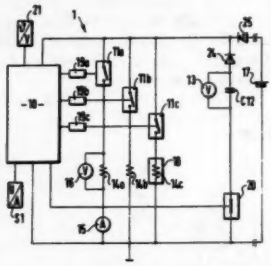
PCT No. PCT/DE88/00372, § 371 Date Apr. 4, 1990, § 102(e) Date Apr. 4, 1990, PCT Pub. No. WO89/04779, PCT Pub. Date Jun. 1, 1989

PCT Filed Jun. 23, 1988, Ser. No. 466,301

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3738862.2

Int. Cl.[5] B60R *21/32, 16/02*

U.S. Cl. 340—438 **19 Claims**



1. A method of actuating a safety device for a motor vehicle, the safety device including an electric storage device coupled to a voltage source, both the electric storage device and the voltage source being coupled to tripping devices for actuating restraining devices on the motor vehicle, comprising the following steps:

monitoring the electric storage device to determine if it is defective;

if the storage device is defective, interrupting the flow of electric current from the storage device to the tripping devices; and

directing electric current from the voltage source to at least one tripping device for a predetermined period of time to actuate the respective tripping device.

5,068,641

DETECTION LABEL FOR AN ANTI-SHOP-LIFTING SYSTEM

Johannes H. L. Hogen Esch, Aalten, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands

Filed Feb. 23, 1990, Ser. No. 483,226

Claims priority, application Netherlands, Feb. 24, 1989, 8900461

Int. Cl.[5] G08B *13/24*

U.S. Cl. 340—551 **20 Claims**

1. A detection label for an anti-shoplifting system attachable to an article to be safeguarded comprising:

a housing;

a fixed clip on said housing having a part thereof spaced from a part of said housing forming a slot in said housing for insertion of a part of the article to be safeguarded;

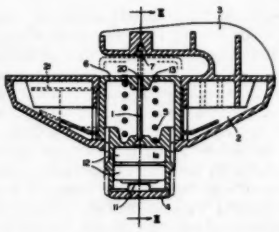
a needle in said housing having a shank, an article piercing tip on one end thereof and a head on the other end thereof for attaching the detection label to the article in a secured position;

operating means movably mounted in said housing and engaging said needle for moving said needle and said tip thereof toward said clip into said secured position;

guiding means in said housing for guiding said needle during said movement of said needle;

a cavity in said clip for receiving said tip of said needle in said secured position;

locking means for locking said needle in said secured position; and



electrical circuit means in said housing detectable by an electromagnetic interrogation field;

said operating means comprising a push button engageable with said head of said needle; and

said guiding means comprising a fabric clamping device resiliently coupled to said push button and having a bore therein through which said shank of said needle extends.

5,068,642

ALARM OR WARNING DEVICE WITH SENSING MEANS IN THE FORM OF A D.C. BIASED SHIELDED COAXIAL CABLE

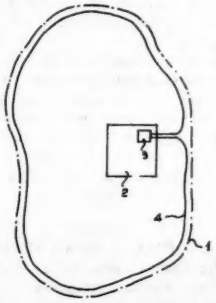
Vincenzo Hruby, Milan, and Raffaele Vizzotto, Casalserugo, both of Italy, assignors to Hesa S.p.A., Milano, Italy

Filed Mar. 29, 1990, Ser. No. 501,125

Claims priority, application Italy, Apr. 7, 1989, 20058 A/89

Int. Cl.[5] G08B *13/26*

U.S. Cl. 340—562 **13 Claims**



1. Alarm or warning device, comprising sensing means in the form of an electrically charged capacitor and an electronic circuit adapted to detect variations in the electric characteristics of said capacitor and to accordingly energize alarm and warning means, wherein said sensing means consist essentially of at least one shielded coaxial cable having shielding and an inner conductor, one or both ends of which cable are connected to said electronic circuit and wherein a D.C. constant biasing potential difference is applied between the shielding and the inner conductor of said cable.

5,068,643

BURGLARPROOF DEVICE

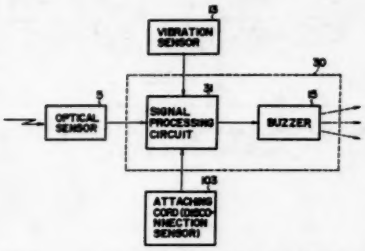
Kazuo Yashina, Tokyo, Japan, assignor to Telo Tsushin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1990, Ser. No. 489,084

Claims priority, application Japan, Mar. 27, 1989, 1-074397; Nov. 10, 1989, 1-293197; Nov. 10, 1989, 1-293198; Jan. 31, 1990, 2-20620; Jan. 31, 1990, 2-20621

Int. Cl.[5] G08B *13/24*

U.S. Cl. 340—571 26 Claims



1. A theft prevention device comprising an optical sensor for detecting a level of ambient light, a vibration sensor for detecting vibration of a protected article, and an alarm circuit operatively coupled to the optical sensor and the vibration sensor for providing an alarm when the optical sensor detects a change in the level of ambient light from relative brightness to relative darkness and the vibration sensor detects a vibration of the protected article.

5,068,644

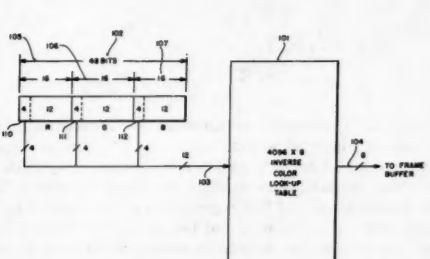
COLOR GRAPHICS SYSTEM

James Batson, Sunnyvale; Ernie Beernink, Mountain View; David Fung, Cupertino; Michael Potel, Los Altos Hills; Art Cabral, Mountain View, and Cary Clark, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 17, 1988, Ser. No. 195,083

Int. Cl.[5] G09G *1/28*

U.S. Cl. 340—701 23 Claims



1. A method for providing a color graphics in a computer system, said method comprising the steps of:

providing said graphics system with a first RGB color information said first RGB color information comprising X bits;

addressing a first table with said first RGB color information said table comprising 2^Y entries, wherein Y is less than X, said first table providing an index value in response to said addressing; and

storing said index value.

5,068,645

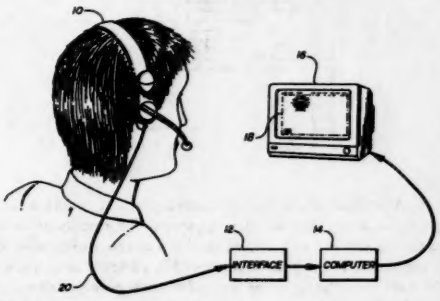
COMPUTER INPUT DEVICE USING AN ORIENTATION SENSOR

Donald E. Drumm, Billerica, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 267,413, Nov. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 108,176, Oct. 14, 1987, abandoned. This application Sep. 25, 1990, Ser. No. 588,499

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—710 17 Claims



1. A computer display system for displaying a cursor and providing controlled movement of the cursor, comprising:

a display screen;

a computer programmed to control the position of a cursor on the display screen in response to cursor control signals;

a computer input device coupled to said computer, the computer input device generating signals representative of the magnitude and direction of angular displacement of the device for a continuous range of angles with respect to a vertical axis passing therethrough for a continuous range of directions;

said input device including

a housing having a circular cross section and center point,

a first light source and a first photodetector mounted opposingly in the plane of the circular cross section of the housing on a first axis extending through the center point of the circular cross section;

a second light source and a second photodetector mounted opposingly in the plane of the circular cross section of the housing on a second axis extending through the center point of the circular cross section, the second axis being displaced from the first axis;

a liquid medium and a gaseous medium, contained within the housing and having a boundary surface therebetween which intersects the center point of the circular cross section; and

differential amplifier means, coupled to said photodetectors;

whereby the output of the differential amplifier is representative of the magnitude and direction of angular displacement of the circular housing within the plane of the circular cross section; and

interface means, coupled to said computer, for generating digital control signals adapted for controlling the position of a cursor in response to the signals representative of the magnitude and direction of angular displacement of the input device so that there is a correspondence between a cursor position on the display screen and said magnitude and direction of angular displacement of said computer input device;

wherein the cursor may be moved from any starting position on the display screen along a continuous path and stopped at a second position on the screen.

5,068,646

DATA DISPLAY

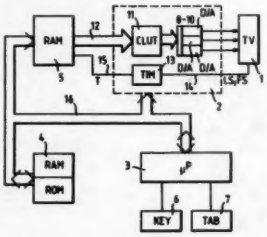
Stephen J. Baker, Horley, England, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 11,075, Feb. 5, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 306,283

Claims priority, application United Kingdom, Feb. 17, 1986, 8603851

Int. Cl.[5] G09G *1/06*

U.S. Cl. 340—725 **20 Claims**



1. A method of displaying a moving object against a fixed background on data display apparatus for displaying as an entity on a screen of a display device a quantity of data which is represented by digital codes stored in a display memory, said displayed data being in the form of discrete pixels or dots each of which has at least one of its color and luminance defined by a respective digital code in said display memory at a location corresponding to the position of the pixel in the display, said data display apparatus including a processor for controlling digitally the storage, selection and display of data including background data, said method comprising:

a) generating the object as a display;

b) converting the shape of the object, as initially displayed, into a machine code program capable of generating digital data display code;

c) during a recurrent display scan cycle, running the machine code program to write into appropriate locations of the display memory at machine code operating speed of said processor the digital data display codes which represent the object, said digital data display codes being generated by said machine code program; and

d) displaying on the screen of the display device the data represented by the digital data display codes in the display memory.

5,068,647

DIGITAL BLANKER FOR SCANNED DISPLAYS

Mark L. Hinton, Bellevue, Wash., and John C. Belka, Jr., Shawnee, Kans., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 3, 1989, Ser. No. 331,912

Int. Cl.[5] G09G *1/00*

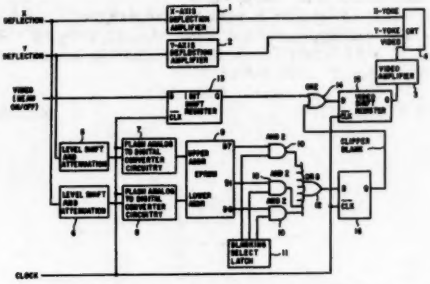
U.S. Cl. 340—734 **17 Claims**

1. A digital blanker for scanned displays comprising:

electronic circuitry means for digitizing a position of a scanned CRT beam;

storage means for recording a predefined area of the scanned display where blanking is required;

comparison means connected to said storage means for comparing the digitized position of the scanned CRT beam with the predefined area where blanking is required; and



means for applying an output of said comparison means to blank said predefined area of a CRT.

5,068,648

DISPLAY CONTROLLER HAVING A FUNCTION OF CONTROLLING VARIOUS DISPLAY MEMORIES

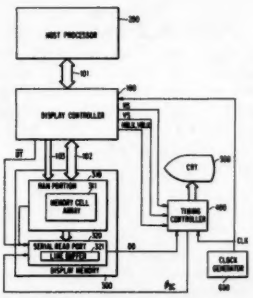
Toshikazu Chiba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 302,893

Claims priority, application Japan, Jan. 29, 1988, 63-20282

Int. Cl.[5] G09G *1/14, 1/02, 3/00*

U.S. Cl. 340—750 **3 Claims**



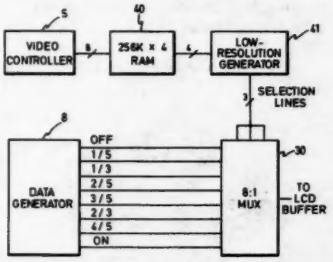
1. A display controller comprising a first register temporarily storing a memory address designating a location of display data in a display memory, said memory address being changed in a predetermined cycle during a data displaying period, first means coupled to said first register for producing a first signal each time a predetermined number of less significant bits of said memory address become a predetermined value second means for generating a second signal each time a horizontal scan line to be displayed is changed, a second register storing first information or second information, third means coupled to said second means and said second register for transferring said second signal when said second register stores said first information and for inhibiting said second signal from being transferred when said second register stores said second information, and fourth means coupled to said first means and said third means for producing an access request signal when said first signal is produced or when said second signal is transferred thereto from said third means.

5,068,649

METHOD AND APPARATUS FOR DISPLAYING DIFFERENT SHADES OF GRAY ON A LIQUID CRYSTAL DISPLAY

James H. Garrett, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 14, 1988, Ser. No. 258,269
Int. Cl.[5] G09G 3/18
U.S. Cl. 340—793 13 Claims



1. A display control system for producing an optical gray-scale image on a display device having an array of display elements each providing a first or a second optical state in response to a first or a second signal level, respectively, th array of display elements having a plurality of rows and a plurality of columns, the system comprising:

means for generating respective display signals for the display elements for producing a gray-scale image of a specified color, the display signals comprising digital signals each having a pattern of bits respectively corresponding to the first or the second signal level, a predefined pattern cycle and a duty cycle related to the optical gray-scale of the image at the position of the respective display element, the pattern of bits of each one of the digital signals being repetitively generated, the means for generating display signals providing successive bits of the display signals for respective diaplay elements in successive timeframes, in each timeframe one bit of each of the display signals being provided in sequence for consecutive display elements in each row from a first to a last display element of the row and for consecutive rows beginning at a first row and ending at a last row of the array, and causing a predetermined skewing of each subsequently generated display signal having a pattern cycle for which the total number of display elements in a row is integrally divisible each time a bit of a respective display signal is provided for the last display element of a row, and causing a predetermined skewing of each subsequently generated display signal having a pattern cycle for which the total number of display elements in the array is integrally divisible each time a bit f a respective display signal is provided for the last display element of the last row of the array.

5,068,650

MEMORY SYSTEM FOR HIGH DEFINITION TELEVISION DISPLAY

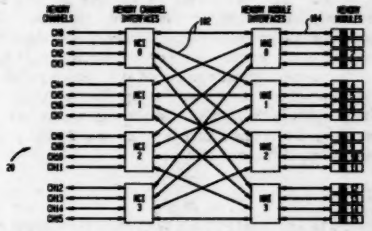
Antonio Fernandez, Brooklyn, N.Y.; Hugo Pinerio Gaggioni, Randolph, N.J.; Martin J. Jaquez, San Diego, Calif.; John D. Robbins, Mountain Lakes; and E. Scott Soper, Morristown, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Division of Ser. No. 253,269, Oct. 4, 1988, Pat. No. 4,947,251.
This application Jun. 11, 1990, Ser. No. 536,028
Int. Cl.[5] G09G 1/02; H04N 5/262
U.S. Cl. 340—799 5 Claims

1. A memory system for composing a plurality of video and still image signals into a single high definition television display, said memory system comprising:

a plurality of memory modules, said memory modules being simultaneously accessible to service memory access requests and each containing a portion of a raster of pixel locations so that together the memory modules form a complete raster array of pixel locations,

a plurality of memory channel interface units for receiving asynchronous memory access requests via a plurality of memory access channels and for synchronizing and storing said memory access requests, and



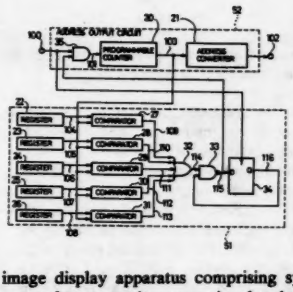
a plurality of memory module interface units for enabling said memory channel interface modules to communicate synchronously with said memory modules to service said memory access requests stored in said memory channel interface units.

5,068,651

IMAGE DISPLAY APPARATUS

Hideharu Takebe, Itami, and Makoto Okura, Kamakura, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,949
Claims priority, application Japan, Oct. 19, 1988, 63-264646
Int. Cl.[5] G09G 3/00
U.S. Cl. 340—814 4 Claims



1. In an image display apparatus comprising sync signal generation means for generating sync signal pulses, display timing signal generation means, image memory means for storing image element data constituting a pattern, having a predetermined raster line number of raster scan lines, of a letter or a character or a drawing, a video circuit for converting said image element data into a video signal according to signals from said sync and display timing signal generation means and display means for displaying the pattern of a letter or a character or a drawing according to the output of said video circuit, an improved programmable memory address generation unit for generating raster addresses that designates selected raster lines in a selected pattern stored in the image memory means to be repeated a predetermined repeat number of times, said unit comprising:

logic means, coupled to receive the sync signal pulses and a raster line designating signal, for transmitting selected sync pulses only when said raster line designating signal is set;

a counter, coupled to receive said transmitted selected sync

pulses, for generating a count signal having a value incremented upon receipt of each selected sync signal pulse and reset when said value is equal to a selected number, said count signal specifying a raster line in the selected pattern;

a plurality of programmable registers for storing a set of integers designating raster scan lines in the selected pattern to be repeated for the predetermined repeat number of selected sync signal pulses; and

raster redesignating means, coupled to receive said count signal and said sync signal pulses, and coupled to said registers, for resetting said raster line designating signal for said predetermined repeat number of sync signal pulses to prevent the incrementing of said count signal for said predetermined repeat number of sync signal pulses when the value of the count signal is equal to the value of one the integers in said set so that the raster scan line designated by the count signal is redesignated said predetermined repeat number of times.

5,068,652

PERSONAL COMPUTER HAVING CONDITION INDICATOR

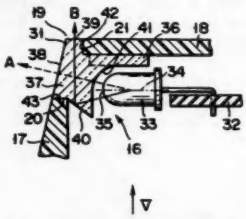
Takaichi Kobayashi, Itsukaichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1990, Ser. No. 542,248

Claims priority, application Japan, Jun. 23, 1989, 1-162218

Int. Cl.[5] G08B *5/22;* **G06F** *1/00*

U.S. Cl. 340—815.03 **10 Claims**



1. A personal computer provided with both a condition indicator and a keyboard, comprising:

a top cover;

an angular section including first and second walls, said first wall being upright on the top cover and having a first indication hole, and said second wall being horizontal and continuous with an upper edge of the first wall and having a second indication hole;

an indication element formed of a light-transmission material of a non light-diffusion type and arranged inside of the angular section, said indication element including a light-transmission portion partly fitted in both the first and second indication holes, and an attachment portion integral with the light-transmission portion and attached to the second wall;

a printed circuit board arranged inside the angular section in the vicinity of the indication element and being substantially parallel to the second wall; and

a light-emitting element attached to the printed circuit board and adapted to emit light toward the first indication hole,

said light-transmission portion including:

a first indication surface which is fitted in the first indication hole and is located on an outer surface of the first wall in an exposed state;

a second indication surface which is fitted in the second indication hole and is located on the outer surface of the second wall in an exposed state;

a slanted reflecting surface located at a lower level than that of the first surface and adapted to reflect part of the light emitted from the light-emitting element toward the second indication surface; and

a light-incident surface extending between a lower edge of the reflecting surface and a lower face of the attachment portion.

5,068,653

CAPACITIVE DISPLACEMENT MEASURING DEVICE WITH T-SHAPED SCALE COATINGS

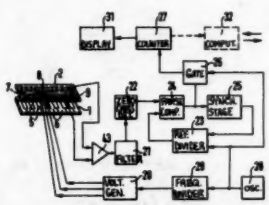
Otto Klingler, Oberndorf-Bochingen; Siegfried Gruhler, Vohringen, and Helmut Rivinius, Bonningheim, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,349

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340782

Int. Cl.[5] G08C *19/10*

U.S. Cl. 340—870.37 **11 Claims**



1. A capacitive displacement measuring device, comprising:

A stationary scale member (1) having a surface (3);

two rows of interengaged T-shaped electrically independent capacitor scale coatings (5,6) defined on said scale member surface, each capacitor scale coating having a leg and a cross with a cross of a scale coating in one row engaged at least partly over a leg of a scale coating of the other row;

a movable sensor member (2) having a surface (4) overlying, facing and spaced from said surface (3) of said stationary scale member, said movable sensor member being movable in a selected direction over said stationary scale member and having an axis extending in said selected direction;

a plurality of transmitting electrode capacitor coatings (7.1, 7.2, 7.3), disposed on said surface (4) of said movable sensor member and overlying at least part of at least some of said capacitor scale coatings;

a plurality of receiving electrode capacitor coatings (8, 9) on said surface (4) of said sensor member, spaced with respect to and electrically isolated from said transmitting electrode coatings;

a grounded shield on said surface (4) of said sensor member disposed in a space between said transmitting and receiving electrode coatings to isolate said transmitting electrode coatings from said receiving electrode coatings; and

A.C. voltage means connected to said transmitting electrode coatings for applying an electrically rotating field to said plurality of transmitting electrode coatings;

said receiving electrode coatings being disposed with respect to said transmitting electrode coatings to receive a signal transmitted from said transmitting electrode coatings having a phase position which is proportional to a displacement between said stationary scale member and said movable sensor member.

5,068,654

COLLISION AVOIDANCE SYSTEM

Fredrick K. Husher, Albuquerque, N. Mex., assignor to Hazard Detection Systems, Colorado Springs, Colo.

Filed Jul. 3, 1989, Ser. No. 374,841

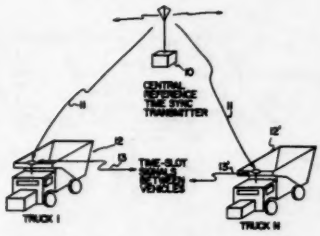
Int. Cl.[5] G08G *1/16;* **G01S** *3/02*

U.S. Cl. 340—903 **12 Claims**

1. A system which comprises:

transmitting means for continually transmitting a reference signal at a predetermined time interval;

a plurality of ground based transponder means for transmitting, in response to receipt of said reference signal, respective data signals at a common predetermined signal strength with horizontal polarization during different unique time periods following reception of said reference signal, each said transponder means being operative for receiving data signals transmitted by other transponder means in said system;



processor means coupled to each said transponder means for processing position status information including range information derived from signal strengths of said received data signals relative to said predetermined signal strength to provide about 10 feet of resolution at a range of 500 feet; and

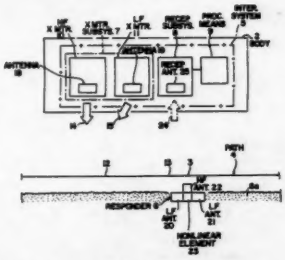
indicating means coupled to each said processor means for indicating a collision threat to an operator based on said range information.

5,068,655

DEVICE FOR DETECTING THE PASSAGE OF AT LEAST ONE MOBILE BODY IN AT LEAST ONE LOCATION FIXED BY ITS TRAVEL

Robert Gabillard, Lille; Yann Nguyen, Dunkerque, and Christian Semet, Neuville en Ferrain, all of France, assignors to Universite des Sciences et Techniques de Lille (U.S.T.L.) Flandres Artois, Villeneuve D'ASCQ, France

Filed Apr. 4, 1990, Ser. No. 504,181
Claims priority, application France, Apr. 4, 1989, 89 04773
Int. Cl.[5] G08G *1/123;* G08B *13/14*
U.S. Cl. 340—988 **9 Claims**



1. A device for detecting the passage of at least one mobile body (2) through a defined location (3) along a path (4) within a space in which displacements of the mobile body are evaluated, comprising:

an interrogation system (5) having a transmission subsystem (7), reception subsystem (8), and a processing means (9) connected to said reception subsystem (8) for processing data received therefrom, said transmission subsystem having a high frequency transmitter (10) for transmitting a high frequency signal in the form of an electromagnetic wave and a low frequency transmitter for establishing a relatively low frequency signal in the form of a magnetic field, each of said transmitters having a source (16, 17) and a transmitting antenna (18, 19), said reception subsystem having a reception antenna (25); and a passive responder (6), one of said responder and interrogation system mounted to the mobile body and the other of said responder and interrogation system being fixed to a support (6a) located on the path, said responder having first and second low frequency antennas (20, 21) tuned to receive the low frequency signal and offset from each other in a direction parallel to said path, high frequency antenna (22) tuned to receive the high frequency signal, and a non-linear element (23) connected to said first and second low frequency antennas and said high frequency antenna for mixing the low frequency signal received by said first and second low frequency antennas and said high frequency antenna to supply a resultant (R) in the form of a modulated carrier wave transmitted over said high frequency antenna (22) to said reception antenna (25); and

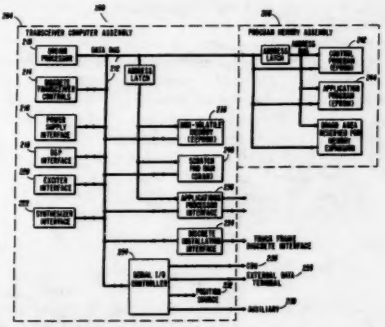
wherein said first and second low frequency antennas are spaced apart from each other in a direction generally parallel to the path, said first and second low frequency antennas are two secondary windings to which said transmitting antenna (19) of said high frequency transmitter (10) serves as a primary winding, said secondary windings arranged such that during passage of the mobile body adjacent to the defined location said secondary windings receive said low frequency signal successively and over a time interval (T_o) both secondary windings receive said low frequency signals at about the same amplitude and opposite polarity such that said reception subsystem receives said resultant (R) in a pattern having as components: two distinct portions (R_a, R_b) of lengths (T_1, T_2), each distinct portion corresponding to a different one of said secondary windings receiving a dominant portion of said low frequency signal, and a top (30) separating said distinct portions corresponding to said time interval (T_o).

5,068,656

SYSTEM AND METHOD FOR MONITORING AND REPORTING OUT-OF-ROUTE MILEAGE FOR LONG HAUL TRUCKS

Dennis W. Sutherland, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1990, Ser. No. 633,639
Int. Cl.[5] G08G *1/123*
U.S. Cl. 340—989 **3 Claims**



1. A system for monitoring and reporting out-of-route mileage trucks comprising:

means for transmitting signals corresponding to geographic coordinates from a central dispatch station to a truck at some distant point;

means for receiving the signals corresponding to the geographic coordinates from the central dispatch;

means for generating route rectangles indicative of areas surrounding road segments to be travelled on board a truck and without driver action having the geographic

coordinates at either a first end of a second end of a route rectangle;

means for providing a position signal corresponding to the current position of the truck;

means for comparing the position signal on board a truck and without driver action with a set of predetermined acceptable positions within a route rectangle;

means for generating an exception report without driver intervention if the position signal is not included in the set of acceptable positions;

means for transmitting the exception report to the central dispatcher; and

means for receiving an exception report on a real-time basis and alerting a central dispatcher of an out-of-route status in a timely manner.

5,068,657

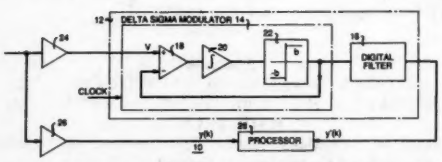
METHOD AND APPARATUS FOR TESTING DELTA-SIGMA MODULATORS

Sheng-Jen Tsai, Newtown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 25, 1990, Ser. No. 528,514

Int. Cl.[5] H03M *1/10*

U.S. Cl. 341—120 **9 Claims**



1. A method for testing a delta-sigma modulator which serves to convert an analog input signal to a digital output signal, comprising the steps of:

sampling an input test signal at a first rate and supplying each successive sample to the delta-sigma modulator which, in turn, produces an output signal in accordance with the sample;

sampling the input test signal at a second rate;

generating an error signal in accordance with the difference between the value of the output signal generated by the delta-sigma modulator in response to each sample obtained at the first sampling rate, and the value of each sample obtained at the second sampling rate; and

comparing the error signal to a preselected value, representing the value of the error signal when the delta-sigma modulator is operating properly.

5,068,658

METHOD AND APPARATUS FOR ANALOG-TO-DIGITAL CONVERSION

Thomas Ohlsson, Vaellingby, and Bo Hjorth, Sollentuna, both of Sweden, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 28, 1991, Ser. No. 662,445

Claims priority, application European Pat. Off., Mar. 2, 1990, 90104106.1

Int. Cl.[5] H03M *1/20*

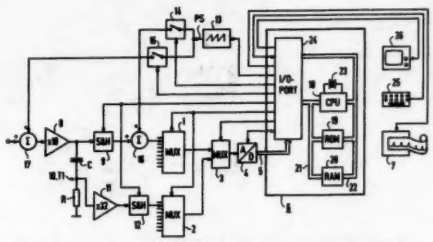
U.S. Cl. 341—131 **25 Claims**

1. A method for analog-to-digital conversion of a chronologically changing, analog electrical signal comprising the steps of:

forming an edited signal by subjecting said input signal to a first transfer function to obtain a resulting signal, and amplifying the resulting signal by a defined gain factor;

chronologically successively sampling said input signal and said edited signal to obtain a sampled input signal and a sampled edited signal;

analog-to-digital converting the sampled input signal to obtain first digital data having a defined number of bits, said defined number of bits defining the dynamic range of the analog-to-digital conversion;



analog-to-digital converting the sampled edited signal to obtain second digital data having said defined number of bits;

multiplying said first digital data by a defined multiplication factor, equal to said defined gain factor to obtain a product;

detecting transgressions of said dynamic range in the analog-to-digital conversion of said edited signal; and

in the event of no transgression of said dynamic range, calculating a final analog-to-digital conversion result based on said product and said second digital data.

5,068,659

DELTA-SIGMA MODULATION ANALOG TO DIGITAL CONVERTER

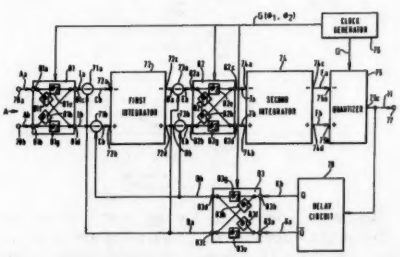
Takashi Sakaguchi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 322,867, Mar. 14, 1989, Pat. No. 4,994,804. This application Aug. 16, 1990, Ser. No. 568,189

Claims priority, application Japan, Mar. 15, 1988, 63-61595

Int. Cl.[5] H03M *3/02*

U.S. Cl. 341—143 **16 Claims**



1. A delta-sigma modulation analog to digital converter for converting an analog input signal to a digital output signal, comprising:

input means for receiving the analog input signal;

clock generator means for generating a very high frequency clock signal with first and second phases;

first switching circuit means, coupled to the input means, for modulating the analog input signal with the very high frequency clock signal;

integration means, coupled to the first switching circuit

means, for integrating the modulated input signal, the integration means also generating a noise signal;

second switching circuit means, coupled to the integration means, both for demodulating the integrated modulated input signal and modulating the noise signal with the very high frequency clock signal;

quantizer means, coupled to the second switching circuit means and responsive to the demodulated integrated modulated input signal and the modulated noise signal, for generating the digital output signal, the digital output signal including a separable portion corresponding to the modulated noise signal; and

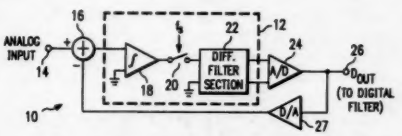
feedback circuit means, coupled between the quantizer means and the integration means, for both generating a feedback signal corresponding to the digital output signal and feeding the feedback signal to the integration means.

5,068,660

COMBINING FULLY-DIFFERENTIAL AND SINGLE-ENDED SIGNAL PROCESSING IN A DELTA-SIGMA MODULATOR

Eric J. Swanson, Buda, and Bruce P. Del Signore, Austin, both of Tex., assignors to Crystal Semiconductor Corporation, Austin, Tex.

Filed Oct. 27, 1989, Ser. No. 428,397
Int. Cl.[5] H03M *3/02*
U.S. Cl. 341—143 **9 Claims**



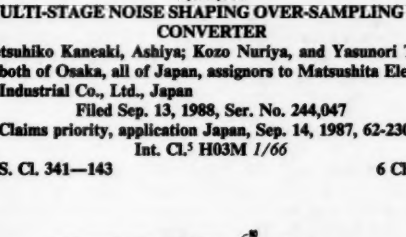
1. A plurality of serially coupled integrators in an analog-to-digital modulator characterized in that at least one of said integrators is a single-ended integrator and at least another of said integrators is a fully-differential integrator.

5,068,661

MULTI-STAGE NOISE SHAPING OVER-SAMPLING D/A CONVERTER

Tetsuhiko Kaneaki, Ashiya; Kozo Nuriya, and Yasunori Tani, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 13, 1988, Ser. No. 244,047
Claims priority, application Japan, Sep. 14, 1987, 62-230114
Int. Cl.[5] H03M *1/66*
U.S. Cl. 341—143 **6 Claims**



1. An over-sampling digital-to-analog converter, comprising:

a noise shaping quantization circuit coupled to receive a digital signal as input, for producing a quantized output signal;

a digital-to-analog conversion circuit for converting said quantized output signal to an analog signal;

wherein said noise shaping quantization circuit has final quantization levels of $-L, -(L-1), \ldots, -1, 0, +1, \ldots, +(L-1), +L$, where L is a positive integer, and in which said noise shaping quantization circuit comprises:

a single-integration sigma delta modulation circuit coupled to receive said input digital signal;

a double-integration sigma delta modulation circuit coupled to receive a quantization error signal produced from said single-integration sigma delta modulation circuit;

differentiator means for differentiation an output signal produced from said double-integration sigma delta modulation circuit; and,

adder means for summing an output signal produced from said differentiator means and an output signal produced from said single-integration sigma delta modulation circuit;

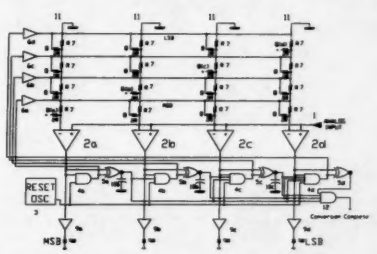
wherein said digital-to-analog conversion circuit converts a sum output signal produced from said adder means to an analog signal, and wherein said single-integration sigma delta modulation circuit has quantization levels of $-N, -(N-1), \ldots, -1, 0, +(N-1), +N$, where N is a positive integer, and said double-integration sigma delta modulation circuit has quantization levels of $-M, -(M-1), \ldots, -1, 0, +M$, where M is a positive integer which is less than N.

5,068,662

NEURAL NETWORK ANALOG-TO-DIGITAL CONVERTER

Suresh Guddanti, and William P. Mounfield, Jr., both of Baton Rouge, La., assignors to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed Sep. 27, 1990, Ser. No. 589,172
Int. Cl.[5] H03M *1/38, 1/36*
U.S. Cl. 341—161 **10 Claims**



1. A circuit comprising:

(a) an analog input for receiving an analog input voltage;

(b) a plurality of n logic elements connected to said analog input, wherein n is an integer greater than 1, and wherein for each integer k greater than or equal to 1 and less than or equal to n, the kth logic element comprises:

(i) a comparison voltage input for receiving a kth comparison voltage; and

(ii) means for comparing whether the analog input voltage is greater than the kth comparison voltage; and

(iii) if k is less than n, means responsive to said comparing means for the (k+1)st logic element, for inhibiting said kth logic element when the result of said comparing means for the (k+1)st logic element changes, until a selected time interval after the completion of said change; and

(c) a plurality of n comparison voltage generators, one said comparison voltage generator connected to each of said comparing means, wherein for each integer j greater than or equal to 1 and less than or equal to n, the jth comparison voltage generator comprises means for generating the jth comparison voltage, wherein the jth comparison voltage is substantially proportional to

$$\sum_{i=j}^{n} s_i 2^i,$$

wherein

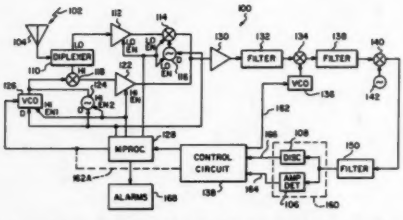
$$s_i = \begin{cases} 1 & \text{if } i = j; \\ 1 & \text{if } i > j, \text{ and if the } i\text{th comparing means determined that the analog input voltage was greater than the } i\text{th comparison voltage;} \\ 0 & \text{if } i > j, \text{ and if the } i\text{th comparing means determined that the analog input voltage was less than the } i\text{th comparison voltage.} \end{cases}$$

5,068,663

MOTOR VEHICLE RADAR DETECTOR INCLUDING AMPLITUDE DETECTION

Michael D. Valentine; Stephen R. Scholl, and Marwan E. Nusair, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Filed Jan. 24, 1991, Ser. No. 645,587
Int. Cl.[5] G01S 7/42
U.S. Cl. 342—20 **36 Claims**



1. A motor vehicle radar signal detector for alerting an operator of a motor vehicle receiving incoming radar signals, said detector comprising:

receiver means for receiving incoming radar signals at frequencies within at least one frequency band;

radar signal processing means responsive to said incoming radar signals for generating a final intermediate frequency signal within a final intermediate frequency range, said radar signal processing means comprising variable frequency mixer means including a local oscillator for generating a local oscillator signal which is swept across a frequency range corresponding to said at least one frequency band;

amplitude detection means receiving said final intermediate frequency signal for generating a signal strength signal representative of the amplitude of said final intermediate frequency signal;

signal verification means responsive to said signal strength signal for identifying valid incoming radar signals; and

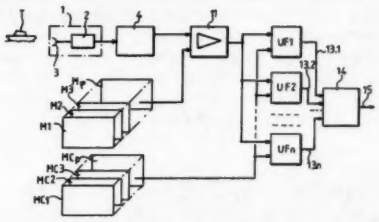
alarm means for alerting an operator of a motor vehicle upon identification of valid incoming radar signals.

5,068,664

METHOD AND DEVICE FOR RECOGNIZING A TARGET

Alain Appriou, Saclay; Régis Barthelemy, Les Ulis, and Colette Coulombeix, Chatenay Malabry, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Oct. 24, 1990, Ser. No. 602,488
Claims priority, application France, Oct. 24, 1989, 89 13928
Int. Cl.[5] G01S 7/295; G06K 9/64
U.S. Cl. 342—90 **9 Claims**



1. Method for recognizing a target (T) among a plurality of n known targets Ti (with i=1,3,4, . . . , n), wherein:

in a first preparatory step, for each of said known targets (Ti) first values (CKi) are determined representative of a plurality of p recognition criteria Ck (with k=1,2,3, . . . , p);

in a second preparatory step, from direct examination of said n known targets (Ti), using said first values (CKi) and for each recognition criterion (Ck), nxp second values (PCk(Ti)) are established each representative of the probability for a target (Ti) to be recognized when it is examined whereas it is the target (Tj) which is examined (j=1,2,3, . . . , n); and

in a step for recognizing said target:

by direct examination of said target (T) to be recognized and from said first values (CKi) determined by said first preparatory step, at least p third values (pCk(Ti)) are established representative of the probabilities, for each recognition criterion (Ck), that the target (T) to be recognized is each of said n known target (Ti) insofar as each of said p criteria is concerned;

said nxp third values associated with the same known target (Ti) are merged together by taking into account said nxp second values, so as to obatin n fourth values (p(Ti)), each of which is representative of the probability that the target to be recognized is one of the known targets (Ti); and

the identity of the target to be recognized (T) is determined from the largest of said fourth values.

5,068,665

ARCHITECTURE FOR THE IMPLEMENTATION OF RADAR DISPLAYS

Francesco Piazza, Via Loik, 7, Jesi (AN), and Antonio Pierfederici, Via XXIV Maggio, 32, San Michele Al Fiume (PS), both of Italy

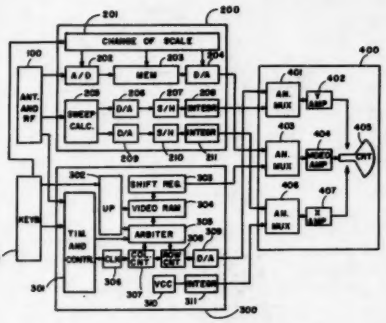
Continuation of Ser. No. 413,223, Sep. 27, 1989, abandoned. This application Apr. 4, 1991, Ser. No. 681,403
Claims priority, application Italy, Sep. 29, 1988, 630 A/88
Int. Cl.[5] G01S 7/04
U.S. Cl. 342—177 **14 Claims**

1. In an echo receiving system which receives an echo signal and generates a corresponding first video signal defining a polar plan image of said echo signal, and which generates a second signal defining a cartesian plan image of auxiliary information about said polar plan image, a display apparatus, comprising:

a video display monitor;

control means connected to said echo receiving system and said video display monitor for operating said video display with said second signal in a raster format, thereby displaying said cartesian plan image, and for periodically inter-

rupting said raster operation to intersperse said first video signal, thereby interleaving said polar plan image,



whereby said polar plan and cartesian plan images appear as a single image on said video display monitor.

5,068,666

RADAR

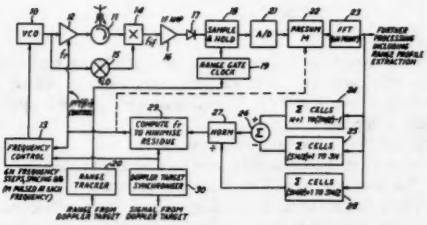
Roger Voles, London, England, assignor to Thorn EMI Electronics Limited, Hayes, England

Continuation of Ser. No. 81,808, Jul. 21, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 412,531

Claims priority, application United Kingdom, Jul. 30, 1986, 8618646; Mar. 27, 1987, 8707444

Int. Cl.[5] G01S *13/10, 13/24, 7/28*

U.S. Cl. 342—192 1 Claim



1. A system for obtaining a range profile, the system comprising a radar and a reference scatterer having a velocity component in the range direction, the radar comprising means for transmitting a succession of pulses at different frequencies to a region and for receiving corresponding returns from scatterers, including the reference scatterer, within said region irradiated by the pulses; transformation means effective to derive from said returns a plurality of transformation signals representing a distribution of pairs of said scatterers, as a function of differential range, and means to influence transmission of said succession of pulses so as to selectively emphasise the effect of the reference scatterer in said plurality as compared with the effect of the other scatterers, said frequencies being transmitted in accordance with a monotonic sequence and the period for transmitting the sequence of frequencies being controllable.

5,068,667

CROSS-POLARIZATION INTERFERENCE CANCELLER

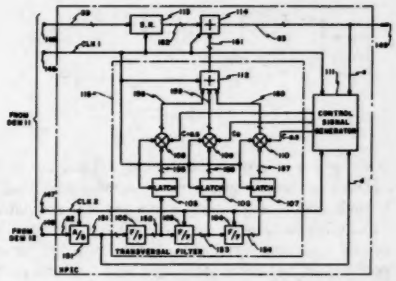
Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 22, 1991, Ser. No. 644,963

Claims priority, application Japan, Jan. 23, 1990, 2-11826

Int. Cl.[5] H01Q *21/06, 21/24;* H04B *7/10*

U.S. Cl. 342—362 5 Claims



1. A cross-polarization interference canceller for use in a digital radio communication system which transmits digital modulated signals over radio frequencies having planes of polarization orthogonal to each other and into which analog baseband signals resulting from the detection of digital modulated signals of a first polarized wave and demodulated signals discriminatively regenerated by detecting digital modulated signals of a second polarized wave are entered to supply demodulated signals of the second polarized wave cleared of the component of interference by the first polarized wave with the second polarized wave, comprising:

analog-to-digital (A/D) converting means for sampling said analog baseband signals with a first sampling frequency equal to double the frequency of the modulation rate of the second polarized wave and supplying digital data signals;

an N-tap shift register for delaying said digital data signals, each by a period corresponding to the reciprocal of said first sampling frequency, and supplying first through Nth ($N \geqq 2$) delayed digital data signals;

latching means for latching said digital data signals and said first through Nth delayed digital data signals, each by a period corresponding to the reciprocal of the modulation rate of said second polarized wave, and supplying first through $(N+1)$th latched digital data signals;

tap coefficient generating means responsive to said digital data signals of said first polarized wave and said demodulated signals of said second polarized wave cleared of the component of interference by the first polarized wave, for generating first through $(N+1)$th control signals;

first through $(N+1)$th multiplying means, supplied with a second sampling frequency equal to the frequency of the modulation rate of said second polarized wave, for multiplying the matching pairs of said first through $(N+1)$th latched digital data signals and said first through $(N+1)$th control signals and supplying first through $(N+1)$th multiplication product signals;

first adding means, supplied with said second sampling frequency, for adding said first through $(N+1)$th multiplication product signals and supplying an interference cancelling signals;

first delaying means for delaying said demodulated signals by a predetermined lag and supplying delayed demodulated signals; and

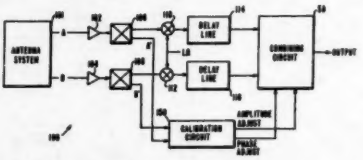
second adding means, supplied with said second sampling frequency, for adding said delayed demodulated signals and said interference cancelling signal, and supplying said demodulated signals cleared of said component of interference.

5,068,668

ADAPTIVE POLARIZATION COMBINING SYSTEM

George I. Tsuda, Fullerton, and Dan E. Snyder, La Mirada, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 6, 1989, Ser. No. 403,427
Int. Cl.[5] H01Q 21/06; H03H 5/00
U.S. Cl. 342—362 10 Claims



1. An adaptive polarization combining system, comprising:

a receive antenna responsive to an incoming RF signal from a single source and having a first port for providing received first component signals of a first polarization sense of said incoming signal and a second port for providing received second component signals of a second polarization sense of said incoming signal;

means for providing time delayed versions of said first and second component signals;

a calibration circuit responsive to said undelayed first and second component signals and comprising amplitude detecting means for detecting the relative amplitudes of said first and second component signals and providing amplitude detector signals indicative of said relative amplitudes, and phase detecting means for detecting the relative phase differential between said first and second component signals and providing a phase detector signal indicative of said phase differential; and

an adjustable combiner circuit responsive to said delayed versions of first and second component signals and comprising means for electronically adjusting the phase and amplitude of the respective delayed first and second component signals and for combining the phase and amplitude adjusted signals at a single combiner output port to thereby polarization match the system to the polarization of the received signal and maximize the signal-to-noise ratio of the combiner output port signals, said combiner circuit comprising means responsive to said amplitude detector signals and said phase detector signals for adjusting the phase and amplitude of said delayed versions of said first and second signals without loss of information or distortion of the received signal waveform.

5,068,669

POWER BEAMING SYSTEM

Peter Koert, Washington, D.C., and James T. Cha, Fairfax, Va., assignors to APTI, Inc., Washington, D.C.

Filed Sep. 1, 1988, Ser. No. 239,284
Int. Cl.[5] H01Q 1/380, 13/080, 1/280
U.S. Cl. 343—700 MS 15 Claims

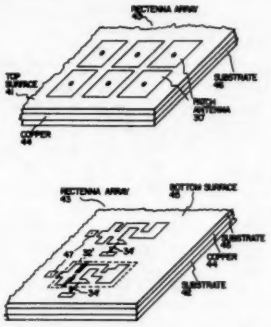
14. A multi-layer rectenna structure comprising:

a. a first substrate having at least one receiving antenna provided thereon;

b. a second substrate having circuit elements provided thereon; and

c. a ground plane located between said first and second substrate; and

d. wherein said circuit elements comprise an impedance matching filter coupled to said receiving antenna via a coupling capacitance, a diode electrically coupled to said



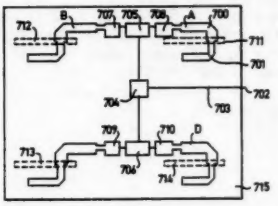
matching filter, and an output filter electrically coupled to said diode.

5,068,670

BROADBAND MICROWAVE SLOT ANTENNAS, AND ANTENNA ARRAYS INCLUDING SAME

Joseph Maoz, 23 Emek Habracha, Tel Aviv 67456, Israel

Continuation-in-part of Ser. No. 186,261, Apr. 26, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 470,203
Claims priority, application Israel, Apr. 16, 1987, 82331
Int. Cl.[5] H01Q 13/10
U.S. Cl. 343—767 17 Claims



1. A broadband microwave antenna exhibiting high radiation efficiency over a broad frequency band in which the VSWR is less than 2.5:1 over at least 15% of the frequency band, comprising:

a dielectric substrate having two sides;

an electrically conductive layer serving as a ground plane on at least one side of the dielectric substrate;

a feed line in the form of a feed strip of electrically conductive material at the other side of the dielectric substrate;

said ground plane being formed with at least one radiating slot having a feed end at one side of the slot, and a load end at the opposite side of the slot, said feed end being electromagnetically coupled to said feed strip for feeding thereto the energy to be radiated or received;

said feed strip being of uniform width for substantially its complete length, but including a change in width at the feed end of the slot to produce a first impedance matching network at the feed end of the slot effective to bring the slot impedance to the level of the feed line over said broad frequency band;

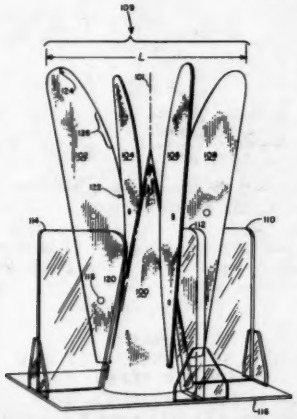
said feed strip including another change in width at the load end of the slot to produce a second impedance matching network which reduces the slot reactance to match the reactive impedance of the load to the reactive part of the slot impedance over said broad frequency band.

5,068,671

ORTHOGONALLY POLARIZED QUADRAPHASE ELECTROMAGNETIC RADIATOR

Michael C. Wicks, Utica, and Paul V. Etten, Clinton, both of N.Y., assignors to The United States of America as representated by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 24, 1988, Ser. No. 218,198
Int. Cl.[5] H01Q *21/20, 1/48*
U.S. Cl. 343—799 23 Claims



1. Antenna apparatus comprising the combination of:

a plurality of radiating elements each resident in one plane of a family of intersecting radiating element planes that are of equal angle spacing about a common plane intersection axis;

each of said radiating elements having an airfoil like cross-section shape in its radiating element plane of residence with the airfoil under surface line in said cross-section shape facing outward and away from said common axis and the airfoil curving most surface line in said cross-section shape facing toward said common axis and lying in predetermined separation therefrom and with the airfoil leading edge portion in said cross-section shape facing a first distal end of said axis and the airfoil trailing edge portion in said cross-section shape facing an opposite second distal end of said axis;

a conically shaped ground plane element disposed centrally of said radiating elements along said axis with an apex portion thereof facing said axis first distal end and a planar base portion thereof facing said axis second distal end;

means for coupling electrical energy signals of predetermined relative phase relationship with each of said radiating elements.

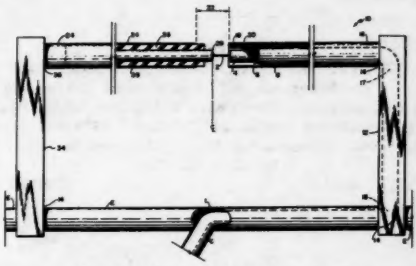
5,068,672

BALANCED ANTENNA FEED SYSTEM

Peter K. Onnigian, 1236 40th Ave., Sacramento, Calif. 95827, and Philip M. Onnigian, 7449 Fox Hills Dr., Citrus Heights, Calif. 95610

Filed Mar. 6, 1989, Ser. No. 318,858
Int. Cl.[5] H01Q *1/50*
U.S. Cl. 343—859 15 Claims

1. A dipole antenna having an integral balun and impedance matching structure comprising two axially spaced conductors defining a gap therebetween, an antenna conductor, means joining said spaced conductors to said antenna conductor, said axially spaced conductors, said joining means and said antenna conductor forming a folded loop having an overall electrical length which is a small fraction of the operating wavelength, a coaxial cable secured to a portion of said antenna conductor and extending to an end location of one of said spaced conductors at said gap, a dielectrically insulated conductor secured to the other of said spaced conductors to form a capacitor therewith, the center conductor of said coaxial cable being connected to said dielectrically insulated conductor across said gap; and an extended antenna radiator extending outwardly from end portions of said antenna conductor to form said dipole antenna.

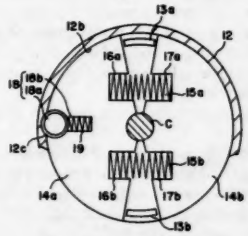


5,068,673

CLUTCH DEVICE FOR ELECTRICALLY EXTENSIBLE ANTENNAS

Misao Kimura, Tokyo, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,651
Int. Cl.[5] H01Q *1/80, 00/100;* B60R *11/20;* F16D *7/20*
U.S. Cl. 343—901 1 Claim



1. A clutch device for electrically driven telescopic antennas characterized in that said clutch device comprises: a first rotary element which is in a circular plate form; a second rotary element which is in a cylindrical shape with a closed end has a circumferential wall and is positioned concentrically with said first rotary element so that an open end of said second rotary element faces one side of said first rotary element, said second rotary element having an engaging recess formed in an inner surface of the circumferential wall; a plurality of sector-shape sliding contacts mounted on one side of said first rotary element which faces the open end of said second rotary element so that said sector-shape sliding contacts can rotate together with said first rotary element, circumferential surfaces of said sliding contacts being in ann arc shape so as to slide in contact with said inner surface of the circumferential wall of said second rotary element; elastic bodies mounted inn an elastically compressed state between said sliding contacts so that respective arc-shaped surfaces of said sliding contacts are pressed against said inner surface of the circumferential wall of said second rotary element; and an engagement assembly provided in at least one of said sector-shape sliding contacts which are pressed against said inner surface of the circumferential wall of said second rotary element by said elastic bodies, a portion of said engagement assembly projecting beyond said arc-shaped surface of said sector-shape sliding contact so as to be capable of engaging via pressing contact with the engaging

recess of said second rotary element, wherein one of said first rotary element and second rotary element is used as a main driving clutch plate connected to a motor, while the other of said rotary elements is used as a driven clutch plate connected to an antenna.

5,068,674

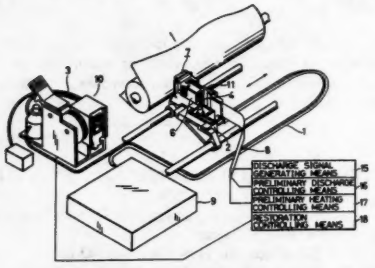
LIQUID JET RECORDING HEAD STABILIZATION

Koichi Sato, Yokohama, and Masami Ikeda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 363,524, Jun. 7, 1989, Pat. No. 4,929,964. This application Mar. 1, 1990, Ser. No. 486,910

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—1.1 **38 Claims**



1. A method for preparing an ink jet recording head which records using a plurality of electrical signals applied in a course of recording, having an electro-thermal energy convertor comprising a heat-generating resistor for generating heat energy for discharging an ink by an application of said electrical signals and a pair of electrodes for applying said electrical signals each having a voltage to said heat-generating resistor, said method comprising;

performing an aging step, said aging step being performed by;

applying sufficient aging electrical signals each having a voltage V to said heat-generating resistor so as to that said heat-generating resistor and stabilize a resistance value of said heat-generating resistor through heat treatment of said heat-generating resistor;

selecting said aging electrical signals applied in the course of said aging step to each have a different voltage from said electrical signals applied in the course of recording;

selecting the voltage V applied in the course of said aging step in relation with a foaming initiating voltage V_0 so that a K-value representing a ratio V/V_0 is within a range of 1.15 to 1.25; and

limiting said aging step to between about two and about fifteen minutes in duration.

5,068,675

FACSIMILE APPARATUS HAVING HEAT FIXATION DEVICE

Masanori Momose, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 449,758

Claims priority, application Japan, Dec. 15, 1988, 63-317244; Dec. 21, 1988, 63-324507

Int. Cl.[5] G01D *15/10*

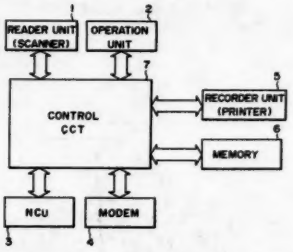
U.S. Cl. 346—76 PH **15 Claims**

1. A facsimile apparatus comprising:

communication means for receiving through a communication line transmitted image data from a remote communication apparatus;

recording means for forming a visible image on a recording material according to the image data which is transmitted from the remote communication apparatus and received by said communication means;

fixing means for heat-fixing the visible image formed on the recording material by said recording means, said fixing means comprising a heating member, a heat resistant sheet



travelling with the recording material and pressing means opposed to and in pressure contact with said heating member; and

control means for controlling said fixing means to start heating and stop said heating after completion of image data recording of at least one sheet.

5,068,676

IMAGE DATA STORING DEVICE FOR AN IMAGE FORMING APPARATUS

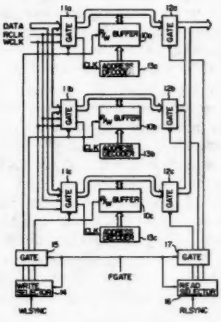
Yoshiki Yoshida, Yokohama, and Kenichirou Asada, Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,337

Claims priority, application Japan, Aug. 21, 1989, 1-213081

Int. Cl.[5] G01D *9/42;* **H04H** *1/21*

U.S. Cl. 346—108 **1 Claim**



1. An image data storing device for an image forming apparatus, comprising:

a plurality of line buffers for storing one line of data each;

writing means for writing image data transferred from external equipment to said plurality of line buffers in response to an external line synchronizing (sync) signal fed from said external equipment;

internal line sync signal generating means for generating an internal line sync signal which is not synchronous to said external line sync signal;

image forming signal generating means for generating an image forming signal in association with an image forming period for forming one frame of image;

selecting means for causing each of said plurality of line buffers into particular one of a read state, a write state, and an inoperative state; and

control means for causing, during a non-image forming period, said selecting means to selectively cause said plu-

rality of line buffers into said read state, write state and inoperative state in response to said image forming signal while, during a non-image forming period, causing said selecting means to maintain said plurality of buffers in said read state, write state, and inoperative state.

5,068,677

LASER SCANNER WITH SELECTED PLURAL BEAM SOURCES

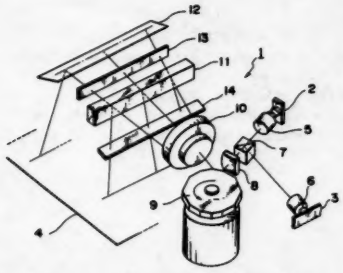
Kazuo Matsuura; Hitoshi Sekino; Keizo Nishiguchi, and Narutaka Yoshida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 409,102, Sep. 19, 1982, abandoned. This application Oct. 5, 1990, Ser. No. 595,688

Claims priority, application Japan, Sep. 20, 1988, 63-235860; Sep. 20, 1988, 63-235861; Sep. 20, 1988, 63-235862

Int. Cl.[5] G01D *15/16;* G02B *26/08*

U.S. Cl. 346—108 15 Claims



1. A laser beam scanning apparatus comprising:

plural laser beam sources for emitting laser beams modulated by a picture signal and having different characteristics from each other;

a beam composition means for composing the beams emitted from said laser beam sources to form one laser beam;

a deflecting means for deflecting the composite laser beam in a main scanning direction thereof;

a beam splitter for splitting the deflected laser beam on the basis of the characteristic of the laser beam; and

a beam-selecting means for selecting the laser beam in correspondence with the characteristic of the laser beam split by said splitter, said beam-selecting means arranged between said splitter and the substance to be illuminated on an optical path of the beam,

wherein each split laser beam illuminates on a different part of a substance to be illuminated.

5,068,678

DEVICE FOR DRIVING PHOTOGRAPHING LENS AND FINDER DEVICE OF CAMERA HAVING ZOOM LENS

Makoto Mogamiya, and Tahei Morisawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

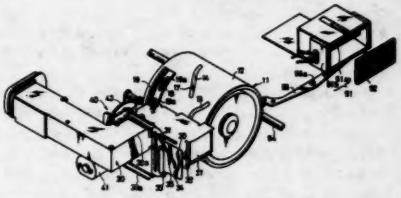
Filed Sep. 27, 1989, Ser. No. 414,123

Claims priority, application Japan, Sep. 29, 1988, 63-127923[U]

Int. Cl.[5] G03B *3/00, 13/10*

U.S. Cl. 354—199 11 Claims

1. A zoom lens camera having a zoom photographing lens and zoom finder device which are driven in association with each other so that the image plane and the finder field of view correspond to each other, and a pair of pinions for the zoom photographing lens and the zoom finder device, respectively, said pinions provided in a gear train driven by a reversible motor so that the zoom photographing lens and the zoom finder device are driven by the respective pinions, wherein said zoom photographing lens has a cam ring which effects zooming by rotation, said cam ring having a gear secured thereto



which is in mesh with said pinion for the zoom photographing lens.

5,068,679

IMAGING SYSTEM FOR MACROPHOTOGRAPHY

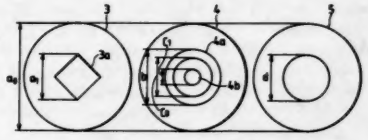
Juro Kikuchi, Kitatsuru, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,592

Claims priority, application Japan, Apr. 28, 1989, 1-111290; May 12, 1989, 1-119554

Int. Cl.[5] G03B *9/02*

U.S. Cl. 354—271.1 10 Claims



1. An imaging optical system comprising:

a photographic lens,

a mechanical stop having a variable size aperture, and

a variable focal length lens disposed adjacent to said mechanical stop and having a diameter smaller than a minimum diameter aperture of said mechanical stop,

wherein said imaging optical system allows only a portion of a beam of light traversing the aperture of said mechanical stop to pass through the variable focal length lens when the aperture of said mechanical stop is maximized, and

wherein said imaging optical system allows an entire beam of light traversing the aperture of said mechanical stop to pass through said variable focal length lens when the aperture of said mechanical stop is minimized.

5,068,680

REAR CONVERTER FOR INTERCHANGEABLE LENS CAMERA

Masahiro Kawasaki, and Osamu Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 192,560, May 11, 1988, abandoned, which is a division of Ser. No. 116,820, Nov. 5, 1987, abandoned. This application Dec. 28, 1989, Ser. No. 455,876

Claims priority, application Japan, Nov. 6, 1986, 61-262676; Nov. 6, 1986, 61-262677

Int. Cl.[5] G03B *17/00*

U.S. Cl. 354—286 9 Claims

1. A rear converter comprising:

a body mount (613) matable with a camera body mount of a camera body;

a lens mount (615) matable with a photographing lens mount of a photographing lens;

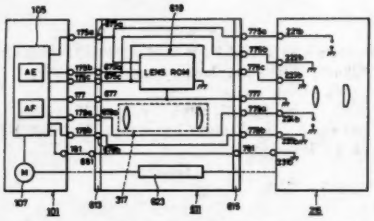
a fixed lens system (317) for changing the focal length of said photographing lens;

storing means (619) for storing at least characteristic data of

said fixed lens system and having a plurality of signal terminals;

a first group of electrical contacts (675) provided on said body mount and respectively connected to different ones of said signal terminals of said storing means, said first group of electrical contacts being capable of electrically contacting with electrical contacts provided on said camera body mount;

a first electrical contact (677) provided on said body mount and connected to another one of said signal terminals of said storing means (619) for supplying electrical power thereto, said first electrical contact being capable of projecting from a surface of said body mount, said first electrical contact being grounded when said camera body is not of an auto-focus type;



a second group of electrical contacts (775) provided on said lens mount and connected to said first group of electrical contacts and to others of said signal terminals of said storing means, said second group of electrical contacts being capable of electrically contacting with a corresponding group of electrical contacts provided on said photographing lens mount;

a second electrical contact (777) provided on said lens mount and connected to said first electrical contact, said second electrical contact being capable of projecting from a surface of said lens mount, said second electrical contact being grounded when said photographing lens is not of the auto-focus type; and

driving force transmitting means (623) for transmitting driving force from said camera body to said photographing lens.

5,068,681

DRYING AIR CONTROL METHOD IN AN AUTOMATIC DEVELOPING MACHINE AND AN AUTOMATIC DEVELOPING MACHINE EMPLOYING THE METHOD

Hiromitsu Kosugi; Shinichi Otani; Teruo Kashino; Masakazu Andoh; Takeo Arai, and Toshiharu Nagashima, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 329,419, Mar. 27, 1989, Pat. No. 4,952,960. This application Jun. 20, 1990, Ser. No. 540,909

Claims priority, application Japan, Mar. 30, 1988, 63-77662; May 23, 1988, 63-126592; Jun. 6, 1988, 63-140254; Feb. 17, 1989, 1-37875

Int. Cl.[5] G03D *3/08;* **F26B** *21/08, 21/10*

U.S. Cl. 354—299 **24 Claims**

1. An apparatus for developing a photographic film having a size variation characteristic, comprising:

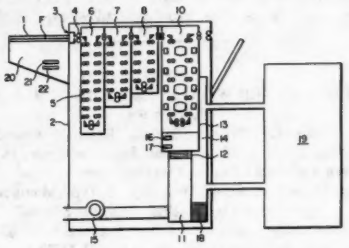
means for processing the film with processing solutions to develop an image on the film;

means for drying the processed film;

first means for detecting the outside atmospheric condition;

second means for detecting a drying condition of said drying means;

computation means for obtaining a film size variation on the basis of the outside atmospheric condition, the drying condition, and the size variation characteristic of the film, and for obtaining an optimum drying condition so as to change the film size variation to a desired film size variation; and



control means for controlling said drying means so as to provide said optimum drying condition.

5,068,682

FOCUS ADJUSTER

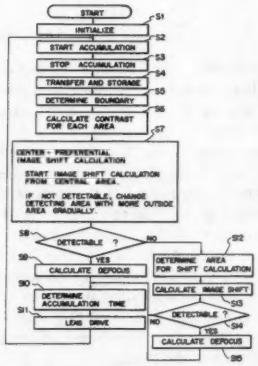
Ken Utagawa, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 435,939, Nov. 14, 1989, abandoned. This application Sep. 24, 1990, Ser. No. 587,601

Claims priority, application Japan, Nov. 16, 1988, 63-287731

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—402 **17 Claims**



1. A focus adjuster comprising:

first and second light-receiving means each including a plurality of photoelectric converting elements in a unidimensional arrangement, said first and second light-receiving means providing respective light intensity distribution signals representing the intensity of light incident on said plurality of photoelectric converting elements;

an optical system for leading light to said first and second light-receiving means from a field to be photographed;

selecting means for selecting a group of adjacent photoelectric converting elements of said first light-receiving means and for determining at least one borderline between said group and the remainder of said first light-receiving means on the basis of changes in the light intensity distribution signal of said first light-receiving means in the direction of arrangement of said plurality of photoelectric converting elements of said first light-receiving means; and

calculating means for producing, according to the light intensity distribution signal of said group and also to a light intensity distribution signal of at least part of the plurality of photoelectric converting elements of said second light-receiving means, a signal representing a relation between the light intensity distribution over said

group and the light intensity distribution over said at least part of the plurality of photoelectric converting elements of said second light-receiving means.

5,068,683

ACCESSORY SHOE ADAPTER FOR VIDEO CAMERA ATTACHED ON BATTERY MOUNT PORTION

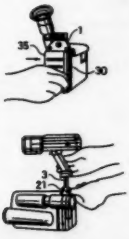
Kiyoshi Miyazaki, Tokyo, Japan, assignor to Kabushiki Kaisha LPL, Higasimurayama, Japan

Filed Aug. 29, 1990, Ser. No. 575,185

Claims priority, application Japan, Mar. 16, 1990, 2-27336[U]

Int. Cl.[5] G03B *7/26*

U.S. Cl. 354—484 **2 Claims**



1. Accessory shoe adapter for video camera comprising:

a shoe mount for accessories;

an adapter body supporting said shoe mount, said adapter body having front and rear sides, a camera mount adapted to be attached to a battery pack mount of the video camera and a battery pack mount adapted to have a battery pack mounted thereon;

said camera mount and said battery pack mount of the adapter body being formed on the front and rear sides of the adapter body, respectively, so as to present mutually complementary geometries; and

said complementary geometries comprising a pair of electric contacts provided with the camera mount corresponding to electric contacts provided on the battery pack mount of the video camera and said battery pack mount of the adapter body being also provided with a pair of electric contacts at locations corresponding to, and electrically connected to, said pair of electric contacts on the camera mount so that, with said battery pack mounted on said adapter and said adapter attached to said video camera battery pack mount, said shoe mount is secured to said camera, and said camera is electrically powered by said battery pack through said adapter.

5,068,684

IMAGE FORMING DEVICE

Nobumasa Abe; Atsushi Kobayashi; Koji Watanabe; Norio Morishita, and Yuji Tanaka, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 391,902

Claims priority, application Japan, Aug. 9, 1988, 63-198502; Nov. 22, 1988, 63-295062; Apr. 17, 1989, 1-97182; Apr. 21, 1989, 1-102282

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **59 Claims**

1. An image forming device including a photosensitive member including a plurality of microcapsules in its surface, each of the microcapsules containing at least a color former and a photosensitive material, the photosensitive member being superimposed on a sheet on which a visible image is to be created before or after the member is exposed to an optical image, the photosensitive member being subjected to pressure after exposure and while the sheet is developed, and the image is fixed, said device comprising:

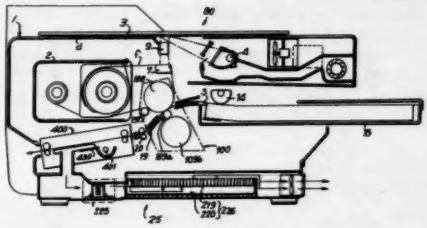
a container for holding the photosensitive member;

an exposure means which exposes the photosensitive member to the optical image;

means for holding the sheet;

development means for superimposing the photosensitive member on the sheet and developing the sheet under pressure and including at least one pressure roller, the development means including pressure-adjusting means for adjusting the pressure applied by the at least one roller;

said pressure-adjusting means including a pressure spring positioned to apply pressure to the at least one roller and spring adjusting means for selectively adjusting the amount of pressure applied by said pressure spring when said roller is in said pressure application position;



said spring adjusting means including means for selectively adjusting the amount of compression of the pressure spring;

said pressure roller displacing means includes pivotable first lever means supporting at one side of the pivot thereof said at least one pressure roller and having at the other side thereof a spring seat; displaceable cam means and cam follower means engaging said cam means and supporting said pressure spring for displacement of the pressure spring into and out of cooperative relation with the spring seat to displace the pressure roller in response to the displacement of the cam means.

5,068,685

IMAGE RECORDING APPARATUS USING MASK MEMBERS AND HAVING MONOCHROMATIC PRINTER PORTION AND MANUAL MASK MEMBER INSERTION TRAY

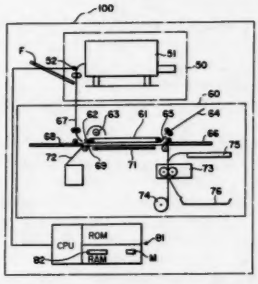
Hidenori Hisada, Tokoname, and Makoto Suzuki, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 27, 1990, Ser. No. 634,460

Claims priority, application Japan, Jan. 29, 1990, 2-18172; Feb. 22, 1990, 2-41603

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—32 **7 Claims**



1. An image recording apparatus for recording a color image with using mask members, each of the mask members being formed with a light shieldable mask image and each of the

mask members being successively fed toward a photosensitive recording medium at an exposure position for superposedly forming latent images thereon upon exposures, the apparatus comprising;

a printer portion for producing the mask members, the printer portion providing an automatic mask member feed mode and also providing means for indicating copying numbers for the automatic feed mode with respect to the mask members;

a color image forming portion for forming an output color image with using the mask members, each of the mask members being introducible from the printer portion to the color image forming portion along a first path, the photosensitive recording medium and the exposure position being positioned within the color image forming portion;

sheet feed means for manually setting another set of mask members and for introducing the another set into the color image forming portion along a second path, the sheet feed means providing a manual mask member feed mode;

means for inputting another copying numbers in case of the manual mask member feed mode; and

means for invalidating the copying numbers indicated by the indication means and for predominating the another copying numbers if the manual mask member feed mode is selected.

5,068,686

COLOR IMAGE RECORDING APPARATUS HAVING TRIAL PRINTING WITH VARIABLE EXPOSURE

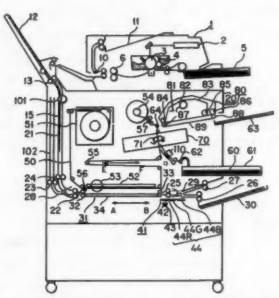
Hiroshi Taira, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 19, 1990, Ser. No. 630,220

Claims priority, application Japan, Feb. 7, 1990, 2-11859

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—32 **12 Claims**



1. A color image recording apparatus for recording a color image on a photosensitive recording medium through mask members for red (R), green (G) and blue (B) images, comprising:

a scanning exposure light source relatively movable along an image area of said photosensitive recording medium;

a driving source for moving said scanning exposure light source at variable scanning speeds;

scanning speed setting means for setting a scanning speed of said scanning exposure light source;

a memory having a first conversion table indicating the scanning speed to be set by said scanning speed setting means and a second conversion table indicating at least one of a different scanning speed correlative with the scanning speed indicated by said first conversion table;

trial print mode inputting means for designating a trial print mode; and

control means for variably driving said driving source in plural stages per image area on the basis of the scanning speeds in said first conversion table and said second conversion table designated by said scanning speed setting means when the trial print mode is set by said trial print mode inputting means, a number of plural stages per image area to be scanned corresponding to a number of scanning speeds designated by said first and second conversion tables.

5,068,687

READER-PRINTER

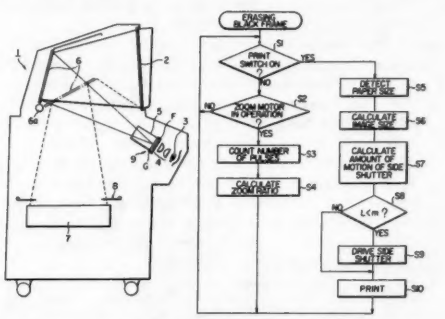
Kuniaki Kamimura; Kenji Sawada, and Yasushi Yamade, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 360,393, Jun. 2, 1989, abandoned. This application Nov. 1, 1999, Ser. No. 607,833

Claims priority, application Japan, Jun. 7, 1988, 63-138545

Int. Cl.[5] G03B *27/58, 13/28*

U.S. Cl. 355—45 **17 Claims**



1. An apparatus for projecting an original image of a microfilm onto a photosensitive member through a projection lens and forming a corresponding copied image on a recording paper, said apparatus comprising;

positioning means for positioning the original image of the microfilm at a prescribed position,

detecting means for detecting the magnification ratio of the projection lens,

memory means for memorizing the size of the original image,

arithmetic means for calculating a size of the copied image to be formed on the recording paper based on the magnification ratio of the projection lens and the size of said original image,

means for providing a size of the recording paper, and

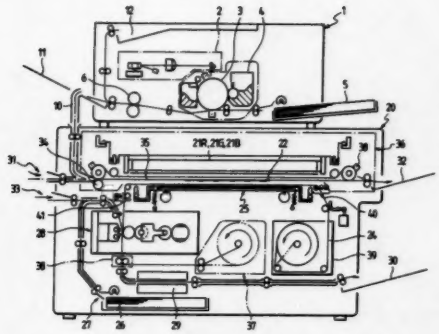
control means for controlling a copying operation so that only the copied image of the calculated size is formed on the recording paper when the calculated size of the copied image is smaller than the size of the recording paper.

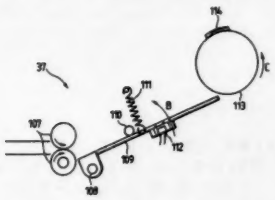
5,068,688

DEVICE FOR AUTOMATICALLY LOADING AN IMAGE RECORDING APPARATUS WITH A RECORDING MEDIUM

Kazunori Tanabe, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaishi, Nagoya, Japan

Filed Mar. 3, 1989, Ser. No. 318,346
Claims priority, application Japan, Mar. 3, 1988, 63-28963[U]
Int. Cl.[5] G03B *27/04;* B65H *16/02*
U.S. Cl. 355—99 6 Claims





1. A device for automatically loading an image recording apparatus with a web of a photosensitive recording medium, said web having a leading end, the image recording apparatus including a take-up roller for taking up the web on a peripheral surface thereof, said device comprising:

a frame;

a pair of conveyor rollers rotatably provided on said frame for holding said web therebetween and conveying said web toward said take-up roller;

a web guide member extending between one of said pair of conveyor rollers and said take-up roller for guiding said web to said take-up roller, said web guide member including a base having two ends, one end thereof being rotatably supported on said frame at a position adjacent to said one of said pair of conveyor rollers and the other end thereof being urged toward said peripheral surface, said guide member further including a detector provided in said base for detecting said leading end of said web, wherein conveyance of said web is stopped when a predetermined period of time has elapsed after said leading end has been detected by said detector; and

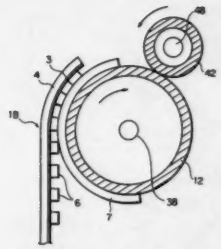
wherein said take-up roller carries an adhesive layer on said peripheral surface and said leading edge of said web is adhered to said adhesive layer.

5,068,689

METHOD FOR TRANSFERRING IMAGES AND AN APPARATUS USED THEREFOR

Nobumasa Sasa; Kunio Shimizu, and Manabu Watanabe, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 2, 1990, Ser. No. 591,751
Claims priority, application Japan, Oct. 4, 1989, 1-259320
Int. Cl.[5] G03B *27/30, 27/02*
U.S. Cl. 355—107 7 Claims



1. A method for transferring an image from a transfer medium onto a recording sheet without gloss being transferred with the image, comprising the steps of:

providing on said transfer medium a support layer with a colored light sensitive layer formed thereover;

positioning an intermediate removable layer between said support layer and said light sensitive layer;

exposing said light sensitive layer to a predetermined image, to form a latent image thereon;

developing only said latent image, other portions of said light sensitive layer remaining undeveloped;

removing said undeveloped portions of said light sensitive layer;

placing said recording sheet on a rotatable sheet carrying member;

superposing said transfer medium over said recording sheet with said developed latent image facing said recording sheet;

pressing said transfer medium and said recording sheet onto said rotatable sheet carrying member while rotating said rotatable sheet carrying member to transfer only said developed latent image to said recording sheet; and

removing said intermediate removable layer and said support layer from said recording sheet whereby only said developed latent image is transferred to said recording sheet.

5,068,690

COPYING APPARATUS WITH IMAGE EDITING DEVICE

Keiji Nakatani, and Hirokazu Yamada, both of Osaka, Japan, assignors to Minolta Camera Kubushiki Kaisha, Japan

Continuation of Ser. No. 154,011, Feb. 9, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 662,991
Claims priority, application Japan, Feb. 10, 1987, 62-29021; Feb. 12, 1987, 62-30251; Feb. 16, 1987, 62-32824; Feb. 16, 1987, 62-32825
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—218 12 Claims

4. Image forming apparatus comprising:

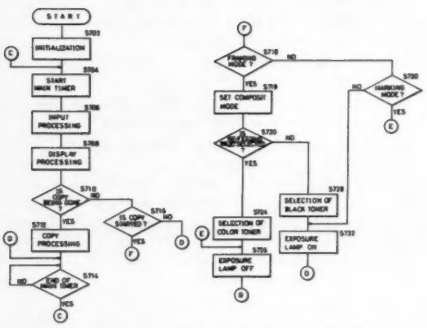
means for inputting data which designates a desired area of an original;

a photoreceptor;

first image forming means for forming an original image in said designated area on said photoreceptor;

second image forming means for forming a frame image, having a width which is constant irrespective of a range of the designated area, for framing said designated area on said photoreceptor;

control means for selectively operating said first image forming means and said second image forming means; and



transfer means for transferring the image formed on said photoreceptor to a copy paper.

5,068,691

DEVELOPING DEVICE WITH A CONTROLLABLE PRESSURE RELEASE FOR THE DEVELOPING ROLLER

Yukio Nishio, Tama, and Kazunori Hirose, Hiratsuka, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 30, 1990, Ser. No. 530,518

Claims priority, application Japan, Jun. 1, 1989, 1-139445; Jun. 5, 1989, 1-141217; Jun. 21, 1989, 1-159320; Jun. 26, 1989, 1-163120

Int. Cl.[5] G03G *15/08*

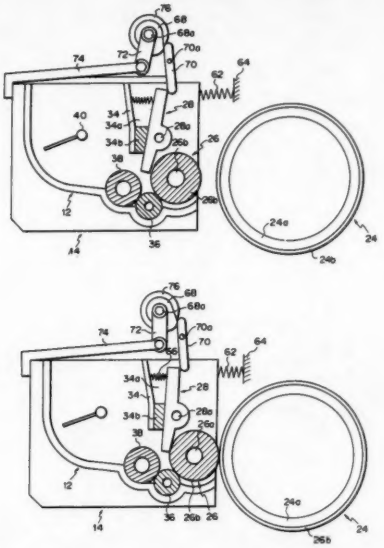
U.S. Cl. 355—259 **29 Claims**

1. A developing device using a one-component developer composed of toner particles, comprising:

a vessel for holding the developer, said vessel being movable between first and second positions;

a developing roller rotatably provided within and supported by said vessel so that a portion of said developing roller is exposed therefrom, the exposed portion of said developing roller being pressed against a surface of an electrostatic latent image carrying body when positioning said vessel at the first position thereof, said developing roller being formed of a conductive elastic material by which the toner particles are entrained to form a developer layer around said developing roller and are carried to the surface of said electrostatic latent image carrying body for development of an electrostatic latent image formed thereon;

a blade member means provided within and movably supported by said vessel, said blade member means being movable between first and second positions, said blade member for regulating a thickness of the developer layer formed around said developing roller when positioning said blade member means at the first position thereof pressed against said developing roller; and



means for moving said vessel and said blade member means from the first positions thereof to the second positions thereof and for controlling at least partial release of the pressures exerted on said developing roller by said electrostatic latent image carrying body and said blade member means, respectively.

5,068,692

ROTATORY MEMBER FOR FIXING AND FIXING DEVICE HAVING THE ROTATORY MEMBER

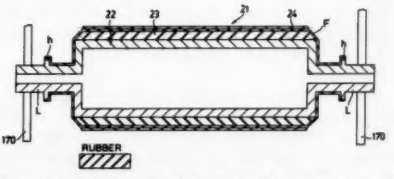
Takeshi Menjo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1990, Ser. No. 529,508

Claims priority, application Japan, May 31, 1989, 1-135740

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—284 **20 Claims**



1. A rotatory member for fixing toner image onto a support member supporting toner image, having:

a core member having a projected portion around the journal portion;

an elastic layer provided on said core member;

an intermediate layer provided on said elastic layer; and

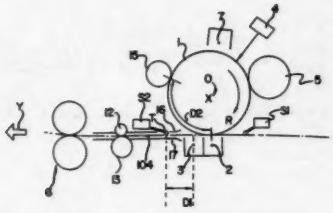
a surface layer provided on said intermediate layer, wherein said intermediate layer is provided so as to cover over from said elastic layer to the projected portion of said core member.

5,068,693

SHEET PATH SENSOR PROVIDED IN AN ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Masanao Nagakura, and Masato Kawashima, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 30, 1990, Ser. No. 530,533
Claims priority, application Japan, Jun. 5, 1989, 1-142750
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—315 4 Claims



1. An electrophotographic image forming apparatus for transcribing an image on a cut sheet comprising:

a rotating photosensitive drum for forming a toner image on a cylindrical surface thereof;

a sheet transfer route for passing a cut sheet against said drum surface;

image transcribing means on said sheet transfer route adjacent said drum for transcribing a toner image formed on the cylindrical surface onto a cut sheet passed through said sheet transfer route;

peel-off means on said sheet transfer route for peeling the cut sheet from said cylindrical surface after image transcription;

cleaning means arranged at a point of said cylindrical surface at a rotation point after said peel-off means for cleaning said drum surface of toner;

fixing means arranged on said sheet transfer route for fixing the toner image transcribed on the cut sheet peeled off by said peel-off means;

a guide piece along said sheet transfer route between said peel-off means and said fixing means for supporting the cut sheet at a back surface of said sheet; and

mechanical sheet path sensing means positioned adjacent said guide piece for sensing a cut sheet passing through said sheet transfer route, said sensing means including lever means protruding downwardly into said sheet transfer route in the absence of a cut sheet passing therethrough, said lever means being pushed upwardly by a peeled off cut sheet passing to said guide piece so as to activate said sensing means, such that force of said lever means on an upper surface of said cut sheet acts to press down said sheet and maintain said back surface of said sheet against said guide piece.

5,068,694

JOSEPHSON INTEGRATED CIRCUIT HAVING A RESISTANCE ELEMENT

Shiro Ohara, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1990, Ser. No. 635,446
Claims priority, application Japan, Dec. 29, 1989, 1-340410; Sep. 25, 1990, 2-254543
Int. Cl.[5] H01L *39/22, 29/12, 1/012;* B05D *5/12*
U.S. Cl. 357—5 3 Claims

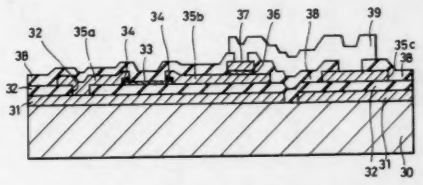
1. A Josephson integrated circuit including therein a Josephson device, said Josephson integrated circuit comprising:

a substrate having an upper major surface and a lower major surface and formed with a Josephson device on the upper major surface;

a resistance strip of zirconium having a lower major surface and an upper major surface and provided on the upper major surface of the substrate;

a first refractory metal layer having a lower major surface and an upper major surface and provided on a first region of the upper major surface of the resistance strip;

a second refractory metal layer having a lower major surface and an upper major surface and provided on a second region of the upper major surface of the resistance strip that is separated from said first region;



a first superconductor interconnection pattern provided on the upper major surface of the substrate so as to cover the upper major surface of the first refractory metal layer; and

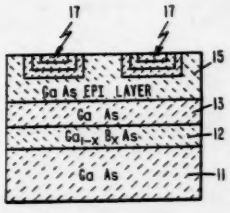
a second superconductor interconnection pattern separated from the first superconductor interconnection pattern and provided on the upper major surface of the substrate so as to cover the upper major surface of the second refractory metal layer.

5,068,695

LOW DISLOCATION DENSITY SEMICONDUCTOR DEVICE

John B. Mooney, San Jose, and Arden Sher, San Carlos, both of Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 187,939, Apr. 29, 1988, Pat. No. 4,916,088.
This application Apr. 9, 1990, Ser. No. 506,046
Int. Cl.[5] H01L *29/161, 29/205*
U.S. Cl. 357—16 29 Claims



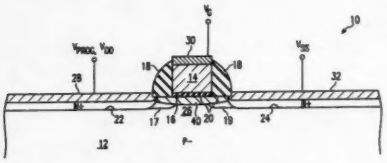
1. A low dislocation density semiconductor structure comprising a non-metallic substrate having the usual dislocation density for the material of the substrate, a first epitaxial layer of a III-V or II-VI semiconductor compound carried by the substrate, the compound being alloyed with atoms of a type and quantity to cause the first epitaxial layer to be formed with a low dislocation density relative to the dislocation density the first epitaxial layer would have if it were not alloyed with the alloying atoms, the number of alloying atoms being such that the alloying atoms are supersaturated in the III–V or II–VI semiconductor compound of the first epitaxial layer, a second epitaxial layer overlaying the first epitaxial layer and consisting of the III–V or II–VI compound of the first layer without the alloying atoms, the second layer having approximately the same lattice constant and dislocation density as the formed low dislocation density first layer.

5,068,696

PROGRAMMABLE INTERCONNECT OR CELL USING SILICIDED MOS TRANSISTORS

Ping Yang, Richardson; Amitava Chatterjee, Dallas; Shian Aur, Plano, and Thomas L. Polgreen, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 332,652, Mar. 31, 1989, Pat. No. 5,019,878.
This application Aug. 29, 1990, Ser. No. 574,981
Int. Cl.[5] H01L 27/01
U.S. Cl. 357—23.1 9 Claims



1. An electrically programmed device with undegraded drain/substrate and source/substrate pn junctions formed at a face of a semiconductor layer having a first conductivity type, comprising:

a source region of a second conductivity type formed at said face;

a drain region of said second conductivity type formed at said face;

a channel region spacing said source region from said drain region;

a conductive layer formed at least on said drain region; and

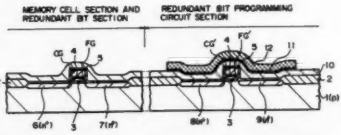
a conductive filament in said channel region that couples said drain region to said source region, whereby the filament is reliably formed from source to drain.

5,068,697

SEMICONDUCTOR MEMORY WHICH IS PROTECTED FROM ERASURE BY LIGHT SHIELDS

Masanori Noda, and Akihiro Nakamura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 17, 1990, Ser. No. 553,374
Claims priority, application Japan, Jul. 18, 1989, 1-186385; Jul. 19, 1989, 1-186299; Jul. 29, 1989, 1-197829
Int. Cl.[5] H01L 29/68, 29/34, 25/04
U.S. Cl. 357—23.5 5 Claims



1. A nonvolatile semiconductor memory device having memory cells in which a control gate is stacked on a floating gate through an insulating film, comprising: p1 a plurality of redundant memory cells for compensating defective memory cells; and

a transistor for selecting said redundant memory cells,

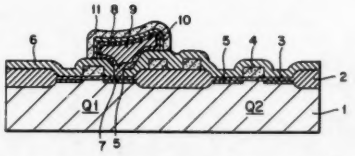
said redundant memory cells and said transistor for selecting said redundant memory cells formed by a nonvolatile memory transistor, and said transistor for selecting sad redundant memory cells having a structure in which a floating gate and a control gate are covered by an anti-reflection film which extends substantially beyond said floating and said control gates and a light shielding film formed over said light shielding film.

5,068,698

MOS SEMICONDUCTOR DEVICE HAVING HIGH-CAPACITY STACKED CAPACITOR

Kuniaki Koyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 586,816
Claims priority, application Japan, Sep. 25, 1989, 1-248533
Int. Cl.[5] H01L 29/68, 27/02, 21/70
U.S. Cl. 357—23.6 3 Claims



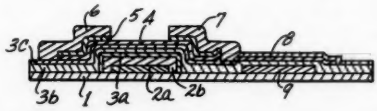
1. A semiconductor memory device having a semiconductor substrate and a plurality of memory cells each including a stacked capacitor having a lower electrode and an oppositely disposed upper electrode, and a MOS transistor electrically connected to said lower electrode, wherein said lower electrode of said stacked capacitor has an island-shaped insulating film formed on said semiconductor substrate and a conductive layer enveloping said insulating film.

5,068,699

THIN FILM TRANSISTOR FOR A PLATE DISPLAY

Kyujeong Chang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 15, 1989, Ser. No. 451,259
Int. Cl.[5] H01L 27/12, 27/01, 23/48
U.S. Cl. 357—23.7 2 Claims



1. A thin film transistor for a plate display comprising first and second gates (2*a* and 2*b*) of different materials stacked one on top of the other, and a storage capacitor (9) on a glass substrate (1), the first gate (2*a*) comprising indium tin oxide and the second gate (2*b*) comprising tantalum, the capacitor (9) having an electrode of indium tin oxide, first, second and third insulating layers (3*a*, 3*b* and 3*c*) formed one on top of another on said second gate, the first insulating layer comprising Ta_2O_5 and a semiconductor layer (4) deposited on said third insulating layer.

5,068,700

LATERAL CONDUCTIVITY MODULATED MOSFET

Yoshihiro Yamaguchi, Urawa; Kiminori Watanabe, Kawasaki, and Akio Nakagawa, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 440,191, Nov. 22, 1989, abandoned.
This application Nov. 29, 1990, Ser. No. 622,351
Claims priority, application Japan, Nov. 29, 1988, 63-301718; May 17, 1989, 1-123601
Int. Cl.[5] H01L 29/68, 29/78, 29/10, 29/74
U.S. Cl. 357—23.8 21 Claims

1. A lateral conductivity modulated MOSFET, comprising:

a semiconductor layer of a first conductivity type;

a first-conductivity type base layer selectively formed in a surface region of said semiconductor layer;

a second-conductivity type source layer selectively formed in a surface region of said first-conductivity type base layer;

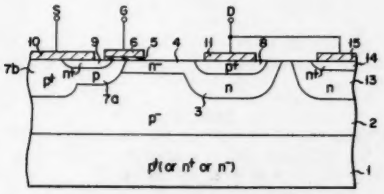
a second-conductivity type base layer selectively formed in said semiconductor layer;

a first-conductivity type drain layer formed in a surface region of said second-conductivity type base layer;

a gate insulation film formed on that surface portion of the first-conductivity type base layer which is sandwiched between said source layer and said second-conductivity type base layer;

a gate electrode formed on said gate insulation film;

a source electrode in contact with both said source layer and said first-conductivity type base layer;



a drain electrode in contact with said drain layer;

a second-conductivity type cathode layer formed in a surface region of said semiconductor layer in such a manner that said second-conductivity type cathode layer is located adjacent to said second-conductivity type base layer and separated from said second-conductivity type base layer; and

a cathode electrode in contact with said cathode layer, said cathode electrode being kept at the same potential level as that of said drain electrode.

5,068,701

DEVICE FOR READING OUT QUANTITIES OF ELECTRICAL CHARGE SUPPLIED BY PHOTODIODES HAVING A SEMICONDUCTOR SUBSTRATE

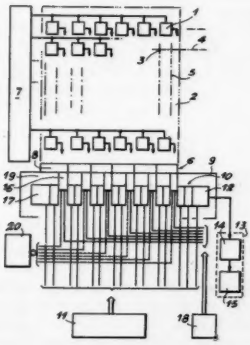
Pascal Prieur-Drevon, Gieres, France, assignor to Thomson-CSF, Puteaux, France

Filed Mar. 21, 1989, Ser. No. 326,516

Claims priority, application France, Mar. 23, 1988, 88 03792

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—24 **5 Claims**



1. A device for reading out quantities of electrical charge supplied by photodiodes (1) having a semiconductor substrate and located at the intersections of rows and columns (4,5) in a matrix array, comprising an assembly (6), storage means (8) for creating storage potential wells in the substrate (2), each said storage potential well corresponding to a respective row or column and serving to store successively, row by row or column by column, charges coming from the respective photodiodes of each row or each column, a charge-coupled device shift register (10) having a semiconductor substrate (9) as well as control means for creating potential wells and transfer potentials in said shift register's substrate to convey electrical charges inside said register up to an output end (12) of said shift register, said end being coupled to means (13) for reading out quantities of charge, and, for each storage means (8), charge transfer means (16) having a semiconductor substrate (9), said charge transfer means having control means (18) for creating, in said substrate, transfer potentials and a receiving potential well for receiving charges contained in the corresponding storage potential well, said receiving potential wells of said transfer means (16) corresponding to the different storage potential wells that are also the potential wells of said shift register (10), and means (20) for injecting bias charges into said receiving potential wells, said control means of each transfer means (16) causing the transfer of bias charges contained in the receiving potential well of said transfer means to the corresponding storage potential well, and then the transfer of said bias charges and at least a part of said stored charges into the receiving potential well, characterized in that said shift register (10) has n successive stages for each photodiode (1), n-1 of these stages forming n-1 intermediate potential wells between, on the one hand, said receiving potential well corresponding to said photodiode and its neighboring photodiode in the same row or column, and on the other, a stage common to both the shift register (10) and said transfer means (16) corresponding to said photodiode and creating the said receiving potential well, the quantity of charge contained in each storage potential well being accounted for by said shift register (10) after n transfers of stored charges and bias charges towards said shift register, and n-1 shift operations, said charge injection means injecting bias charges into all of said shift register's receiving potential wells before each transfer of charge into said receiving potential wells, the quantity of charge to be read out for each photodiode being read after n transfers of stored charge.

5,068,702

PROGRAMMABLE TRANSISTOR

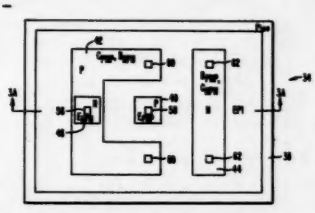
Giovanni P. Giannella, Sunnyvale, Calif., assignor to Exar Corporation, San Jose, Calif.

Continuation of Ser. No. 846,380, Mar. 31, 1986, abandoned.

This application Jan. 19, 1989, Ser. No. 300,246

Int. Cl.[5] H01L *29/72, 27/02*

U.S. Cl. 357—35 **35 Claims**



1. A semi-custom semiconductor chip having a plurality of cells adaptable for forming either a bipolar, lateral PNP or an NPN transistor, each cell comprising:

a first N-doped region;

a first P-doped region;

at least one second P-doped region, larger than said first P-doped region, and positioned to partially surround said first P-doped region on opposite sides of said first P-doped region, said first N-doped region being located immediately adjacent said first P-doped region at a position where said at least one second P-doped region is not between said first P-doped region and said first N-doped region;

a second N-doped region located within one of said first and second P-doped regions;

at least one of said cells being connected to form an NPN transistor and not a PNP transistor; and

at least one of said cells being connected to form a lateral

PNP transistor, and not an NPN transistor, with said second P-doped region as a collector, said first N-doped region as a base and said first P-doped region as an emitter.

5,068,703

ELECTRONIC CIRCUIT DEVICE

Gerhard Conzelmann, Leinfelden-Oberaichen; Dietmar Haack, Reutlingen, and Gerhard Fiedler, Neckartailfingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

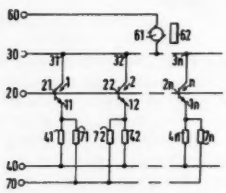
PCT No. PCT/DE88/00034, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO89/07341, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 21, 1989, Ser. No. 477,881

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802767

Int. Cl.[5] H01L *29/83;* **H03F** *1/52;* **H03K** *17/08*

U.S. Cl. 357—36 **32 Claims**



1. An integrated electronic circuit device including a monolithic integrated bipolar power transistor, said device comprising:

a plurality of individual, parallel-connected partial transistors (**1, 2, 3, . . . , *n***), each partial transistor having an emitter, a base, and a collector, having resistors (**41, 42, 43, . . . , 4*n***) connected between their respective emitters and a common emitter line providing the emitter connection for said parallel-connected partial transistors, said resistors stabilizing the distribution of a sum current to the individual parallel-connected partial transistors (**1, 2, 3, . . . , *n***) in the power transistor; and

circuit means connected to a node formed by the connection of at least one of said resistors and the corresponding emitter, said circuit means providing a voltage signal proportional to a current flowing through said at least one of said resistors, said voltage signal being provided to means for providing current regulation or current limiting of a power transistor output.

5,068,704

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Akio Nakagawa, Hiratsuka; Kaoru Imamura, Kawasaki; Ryo Sato, and Tadahide Hoshi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

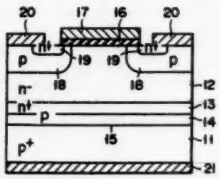
Division of Ser. No. 161,097, Feb. 26, 1988, Pat. No. 4,935,386. This application May 8, 1990, Ser. No. 520,446

Claims priority, application Japan, Feb. 26, 1987, 62-43562; Dec. 28, 1987, 62-330063

Int. Cl.[5] H01L *29/74*

U.S. Cl. 357—38 **7 Claims**

1. In a semiconductor device, the improvement comprising a first semiconductor substrate of a first conductivity type and a second semiconductor substrate of a second conductivity type, which is bonded to said first semiconductor substrate, wherein an emitter region of the first conductivity type is formed in the bonding surface of said second substrate and a total amount per unit area of impurity of said emitter region is $1 \times 10^{13}/cm^2$ to $2 \times 10^{15}/cm^2$, the thickness of said emitter region is 7 μm or



less, and a number of crystal defects exist on the bonding interface, so that an emitter injection efficiency is lowered.

5,068,705

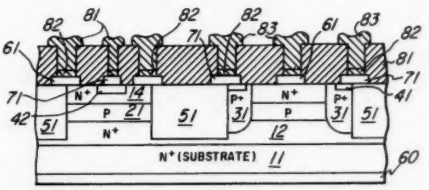
JUNCTION FIELD EFFECT TRANSISTOR WITH BIPOLAR DEVICE AND METHOD

Liem T. Tran, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 560,255, Jul. 31, 1990, abandoned, which is a continuation of Ser. No. 442,407, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 312,414, Feb. 21, 1989, abandoned, which is a continuation of Ser. No. 63,554, Jun. 18, 1987, abandoned. This application Feb. 13, 1991, Ser. No. 655,185

Int. Cl.[5] H01L *27/02, 29/161, 29/167*

U.S. Cl. 357—43 **16 Claims**



1. A semiconductor integrated circuit comprising:

(a) a first layer of a first semiconductor material doped to a first conductivity type and including a bipolar transistor emitter region;

(b) a second layer of a second semiconductor material doped to a second conductivity type on said first layer and including a bipolar transistor base region;

(c) a third layer of said first semiconductor material doped to said first conductivity type on said second layer and including a bipolar transistor collector and a field effect transistor region;

(d) a first doped region in said second and third layers of said second conductivity type for making contact to said second layer at a selected location;

(e) a second doped region within said first doped region of said second conductivity type for making contact to said first doped region;

(f) a third doped region in said field effect transistor region of said second conductivity type providing the gate region of said junction field effect transistor and defining source and drain regions adjacent to said gate region;

(g) an isolation region extending through said second and third layers at a selected location thereof and at least partially surrounding said field effect transistor region to electrically isolate said field effect transistor region from other portions of said second and third layers; and

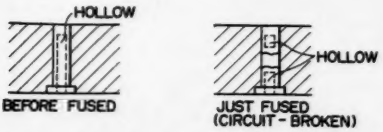
(h) a plurality of electrical conductors selectively disposed on said second and third doped regions, said collector and emitter regions, and said source and drain regions to provide electrical contact terminals for said bipolar transistor and said junction field effect transistor.

5,068,706

SEMICONDUCTOR DEVICE WITH FUSE FUNCTION

Naomasa Sugita, Yokohama; Yoshiharu Yotumoto, Kimitsu; Kouji Moriguchi, Kimitsu, and Toshinobu Sekiba, Kimitsu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 166,002, Mar. 9, 1988, Pat. No. 4,943,842. This application Feb. 12, 1990, Ser. No. 478,536
Claims priority, application Japan, Mar. 11, 1987, 62-54098
The portion of the term of this patent subsequent to Jul. 24, 2007, has been disclaimed.
Int. Cl.[5] H01L *27/02, 23/48, 23/16*
U.S. Cl. 357—51 6 Claims



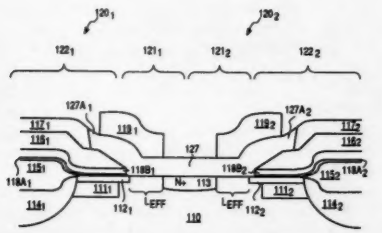
1. A semiconductor device comprising:
a semiconductor element;
a hollow fuse member soldered by a soldering material to the semiconductor element;
means for enclosing the semiconductor element and the fuse member, said enclosing means being filled with a resin so that the semiconductor element and the fuse member are fixed in place; and
a thin coating formed on the fuse member, said coating having a melting point higher than that of the soldering material.

5,068,707

DRAM MEMORY CELL WITH TAPERED CAPACITOR ELECTRODES

Gary A. Pors, Sacramento, and Gernia Tang, Folsom, both of Calif., assignors to NEC Electronics Inc., Mountain View, Calif.

Filed May 2, 1990, Ser. No. 518,607
Int. Cl.[5] H01L *29/04, 23/48, 29/68*
U.S. Cl. 357—59 15 Claims



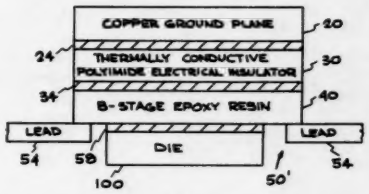
3. A transistor memory cell comprising:
a semiconductor substrate containing a source region and a capacitance region, the source region being separated from the capacitance region by a channel region wherein a first edge of the channel region is adjacent to the capacitance region and a second edge of the channel region is adjacent to the source region;
a first insulating layer formed on the substrate over said capacitance region;
a tapered capacitance electrode formed on said first insulating layer, said tapered capacitance electrode having (i) a first planar surface contacting said first insulating layer, (ii) a second planar surface substantially parallel to said first planar surface, and (iii) an edge surface joining an edge of said first planar surface and an edge of said second planar surface wherein said edge surface intersects said first planar surface at an angle of less than 60°;
a second insulating layer formed on the substrate over the source and channel regions and extending over a portion of said tapered capacitance electrode; and
a transfer gate formed on said second insulating layer.

5,068,708

GROUND PLANE FOR PLASTIC ENCAPSULATED INTEGRATED CIRCUIT DIE PACKAGES

Robert A. Newman, Santa Clara, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 2, 1989, Ser. No. 415,844
Int. Cl.[5] H01L *23/495*
U.S. Cl. 357—68 10 Claims



1. A plastic encapsulated integrated circuit package comprising:
(a) a multilayer rectangular ground plane assembly consisting essentially of:
(i) a rectangular copper metal ground plane member having a thickness ranging from about 1.5 to about 20 mils to provide both heat dissipation and an electrical ground plane for said package;
(ii) a thermally conductive polyimide insulating layer of the same length and width as said ground plane member and having a first surface bonded to said copper ground plane member; and
(iii) a b-stage epoxy layer having the same length and width as said ground plane member and having a first surface bonded to a second surface of said polyimide insulating layer;
(b) a rectangular lead frame having inner lead ends on all four sides which terminate to define an area smaller than said rectangular ground plane assembly and having no central die paddle, said inner lead ends bonded to a second surface of said b-stage epoxy layer of said ground plane assembly to form a composite assembly, whereby said ground plane assembly imparts mechanical strength to said lead frame assembly; and
(c) an integrated circuit die bonded directly to a central portion of said second surface of said b-stage epoxy layer of said composite assembly and electrically connected to leads on said lead frame.

5,068,709

SEMICONDUCTOR DEVICE HAVING A BACKPLATE ELECTRODE

Hidemitsu Egawa, Tokyo; Riichirou Aoki, Ichikawa, and Katsuya Okumura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 028,386, Mar. 20, 1987, Pat. No. 4,875,088. This application Jul. 14, 1989, Ser. No. 380,024
Claims priority, application Japan, Mar. 29, 1986, 61-72116
Int. Cl.[5] H01L *23/48, 29/46*
U.S. Cl. 357—71 10 Claims

1. A semiconductor device comprising:
a semiconductor pellet having a top surface on which an integrated circuit is formed an a back surface formed by a semiconductor material, wherein said semiconductor pellet is formed of silicon; and

backplate electrode means, including a metal silicide film having conductivity and an anti-oxidation property and wherein the metal silicide film forms the outermost surface of the backplate electrode means, said backplate electrode means being formed on the entire back surface of said pellet, for obtaining at said back surface of said pellet a substantially uniform backplate potential;

wherein said metal silicide film essentially consists of a silicide of any of the following backplate metals;

Ti, Mo, Cu, Cr, Ni, Fe, Co, W, Mn, and Pd; and

wherein said backplate electrode means includes a metal layer which is formed on said silicon back surface and which contains any of said backplate metals, and said metal silicide film is formed on said metal layer.

5,068,710

SEMICONDUCTOR DEVICE WITH MULTILAYER BASE CONTACT

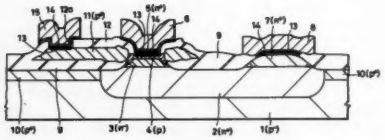
Nobuo Owada, Ohme; Mitsuaki Horiuchi, Fuchu; Masatoshi Tsuneoka, Ohme, and Tadayuki Taneoka, Akishima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 63,023, Jun. 17, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 396,687

Claims priority, application Japan, Jun. 18, 1986, 61-140064

Int. Cl.[5] H01L *23/48, 29/46, 29/04, 29/06*

U.S. Cl. 357—71 **43 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor substrate having a main surface;

a thick oxide film selectively formed on said main surface so as to surround an active region in which a base, an emitter and collector regions of a bipolar transistor become formed;

a base lead-out electrode made of a polycrystalline silicon film which is doped with boron being electrically connected to the base region of said bipolar transistor;

an insulating film being formed on an upper surface of at least said base lead-out electrode so as to cover at least said base lead-out electrode;

a contact hole being formed through said insulating film at lest at above the location wherein the upper surface of said base lead-out electrode is formed;

a metal silicide film being formed on the upper surface of said base lead-out electrode at the location where said contact hole is formed;

a titanium nitride film being formed on said metal silicide film; and

a wiring layer made of a material whose principal component is aluminum being formed on said titaniun nitride film and being electrically connected to said base lead-out electrode via said titanium nitride and metal silicide films.

5,068,711

SEMICONDUCTOR DEVICE HAVING A PLANARIZED SURFACE

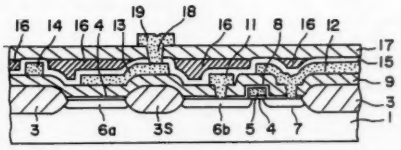
Tatsuya Mise, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1990, Ser. No. 495,514

Claims priority, application Japan, Mar. 20, 1989, 1-68656

Int. Cl.[5] H01L *21/94, 21/95*

U.S. Cl. 357—71 **7 Claims**



1. A semiconductor device having a multi-level interconnection structure, comprising:

one or more active devices;

a substrate for supporting the active devices thereon;

an isolated region provided on the substrate, said isolated region projected from the substrate;

a first insulator layer provided on the substrate and isolated region to cover the active devices and the isolated region, said isolated region causing a projection of the first insulator layer at a part covering the isolated region;

a first conductor pattern provided on the first insulator layer;

a cover layer having a top surface and formed on the first insulator layer and the first conductor pattern to bury the first insulator layer and the first conductor pattern underneath, said cover layer having a projected part in correspondence to the isolated region;

a planarizing layer having a planarized top surface provided on the cover layer to bury the cover layer underneath, said planarizing layer formed such that a part of the top surface of the cover layer, corresponding to the projected part, is exposed by projecting to a level flush to or above the planarized top surface of the planarizing layer;

a second insulator layer provided on the planarizing layer to cover the planarized top surface of the planarizing layer and the exposed part of the top surface of the cover layer;

a contact hole provided on the second insulator layer in correspondence to said isolated region to penetrate through the second insulation layer and the cover layer to expose a desired part of the first conductor pattern while not exposing the planarizing layer; and

a second conductor pattern provided on the second insulator layer in correspondence to the contact hole to fill the contact hole and to make a contact to the exposed part of the first conductor pattern.

5,068,712

SEMICONDUCTOR DEVICE

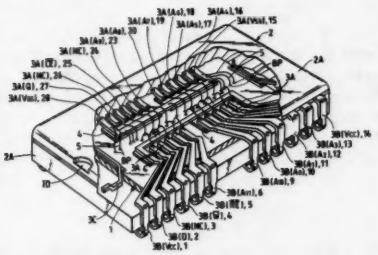
Gen Murakami, Machida; Kunihiro Tsubosaki, Hino; Masahiro Ichitani, Kodaira; Kunihiko Nishi, Kokubunji; Ichiro Anjo, Koganei; Asao Nishimura, Ushiku; Makoto Kitano; Akihiro Yaguchi, both of Shimoinayoshi; Sueo Kawai, Iwama; Masatsugu Ogata, Hitachi; Syuuji Eguchi, Hitachi; Hiroyoshi Kokaku, Hitachi; Masanori Segawa, Hitachi; Hiroshi Hozoji, Hitachi; Takashi Yokoyama, Hitachi; Noriyuki Kinjo, Hitachi; Aizo Kaneda, Yokohama; Junichi Saeki, Yokohama; Shozo Nakamura, Yokohama; Akio Hasebe, Yokohama; Hiroshi Kikuchi, Zushi; Isamu Yoshida, Yokohama; Takashi Yamazaki; Kazuyoshi Oshima, both of Ohme, and Tetsuro Matsumoto, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1989, Ser. No. 409,332

Claims priority, application Japan, Sep. 20, 1988, 63-236156; Mar. 20, 1989, 1-65844

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—72 36 Claims



1. A semiconductor device comprising:

a rectangular semiconductor chip having a principal surface with a circuit and a plurality of external terminals;

a plurality of leads each including an inner lead portion having a first region and a second region and an outer lead portion connected with said second region and extending away from said first region;

at least one insulator interposed between said semiconductor chip and said inner lead portions for electrically insulating said inner lead portions from said semiconductor chip;

a plurality of wires for connecting said external terminals and said first regions electrically; and

a sealing member for sealing up said semiconductor chip, said inner lead portions, said insulator and said wires;

wherein the distance from the second regions of said inner lead portions to the principal surface of said semiconductor chip is larger than the distance from the first regions of said inner lead portions to the principal surface of said semiconductor chip.

5,068,713

SOLID STATE IMAGE SENSING DEVICE

Shigeo Toda, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 393,729

Claims priority, application Japan, Aug. 18, 1988, 63-205542; Aug. 29, 1988, 63-214443; Aug. 29, 1988, 63-214452

Int. Cl.[5] H01L *23/28*

U.S. Cl. 357—72 33 Claims

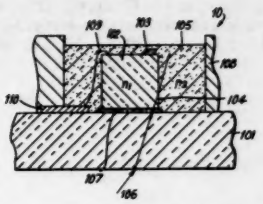
1. A solid state image sensing device, comprising:

a transparent substrate for allowing incident light to pass therethrough;

at least one transparent substrate chip mounted on the substrate and having exposed surfaces for receiving light passing through at least the substrate;

at least one photoelectric converting element disposed on the transparent substrate chip for receiving light passing through at least the substrate and substrate chip; and

anti-reflection mold material disposed on a portion of the transparent substrate and on at least the exposed surfaces of the transparent substrate chip, the refractive index of



the anti-reflection mold material being equal to or higher than the refractive index of the transparent substrate chip.

5,068,714

METHOD OF ELECTRICALLY AND MECHANICALLY CONNECTING A SEMICONDUCTOR TO A SUBSTRATE USING AN ELECTRICALLY CONDUCTIVE TACKY ADHESIVE AND THE DEVICE SO MADE

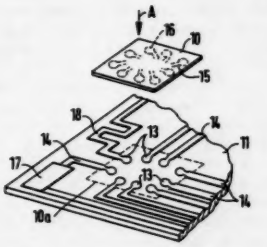
Dieter Seipler, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 452,110

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3910910

Int. Cl.[5] H01L *23/485*

U.S. Cl. 357—80 27 Claims



20. A composite hybrid semiconductor structure having

a carrier plate substrate (**11**);

a plurality of carrier connection pads (**13**) on a first carrier surface of said carrier plate substrate (**11**);

a semiconductor chip or wafer substrate (**10**);

a plurality of chip connecting pads (**16**) on a first chip surface and within the outline of said semiconductor chip or wafer substrate (**10**), comprising, in accordance with the invention,

a layer of electrically conductive tacky material positioned over the pads (**13**, **16**) on at least one of said substrates;

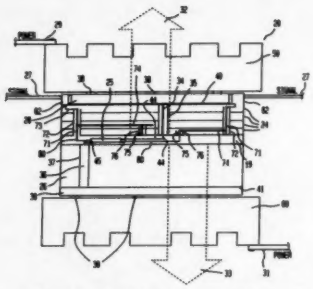
a layer of electrically insulating material on at least one of said substrates, and covering the surface thereof except in the region of said pads,

said substrates being engaged in first carrier surface-to-first chip surface, face-to-face contact against each other, with said pads facing each other, in electrically conductive connection by said electrically conductive tacky material and in adhesive connection by said tack material.

5,068,715
HIGH-POWER, HIGH-PERFORMANCE INTEGRATED CIRCUIT CHIP PACKAGE

Paul C. Wade, Shirley, and JJ Grady, III, Acton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,569
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—81 **27 Claims**



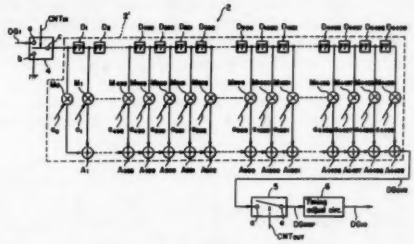
1. An integrated circuit chip package which comprises:
a chip comprising a dielectric material, having top and bottom surfaces;
a plurality of transistors and associated circuitry fabricated in an epitaxial layer within said chip;
a plurality of signal connectors coupled to said transistors and associated circuitry;
a top metallization plane fixedly mounted to said top surface;
a top heat sink fixedly mounted to said top metallization plane to provide a thermal and electrical coupling between said top heat sink and said top metallization plane;
said top metallization plane electrically coupled to said plurality of transistors and associated circuitry and further coupled through said top heat sink to a first electrical power source having a first polarity;
a bottom metallization plane fixedly mounted to said bottom surface;
a bottom heat sink fixedly mounted to said bottom metallization plane to provide a thermal and electrical coupling between the bottom heat sink and the bottom metallization plane;
said bottom metallization plane electrically coupled to said plurality of transistors and associated circuitry and further coupled through said bottom heat sink to a second electrical power source having a second polarity;
a first thermal path for dissipation of heat said first thermal path originating at said plurality of transistors and associated circuitry and passing through said dielectric material, said top metallization plane and said top heat sink; and
a second thermal path for dissipation of heat, said second thermal path originating at said plurality of transistors and associated circuitry and passing through said bottom layer of said dielectric material, said bottom metallization plane and said bottom heat sink.

5,068,716
SAMPLING RATE CONVERTER

Jun Takayama, Tokyo; Tadao Fujita, and Takeshi Ninomiya, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 27, 1990, Ser. No. 499,679
Claims priority, application Japan, Mar. 30, 1989, 1-79532
Int. Cl.[5] H04N *11/04*
U.S. Cl. 358—13 **10 Claims**

1. A sampling rate converting apparatus for converting a sampling rate of an input digital video signal having a first sampling frequency to a second sampling rate having a second sampling frequency different from said first sampling frequency, comprising:
oversampling means receiving said input digital video signal for oversampling the latter at a rate which is an integral multiple of said first sampling frequency so as to generate zero values between data of said input digital video signal;
means connected to said oversampling means for interpolating an output signal therefrom;
decimating means acting on the interpolated output signal for generating therefrom a digital video signal having said second sampling frequency; and

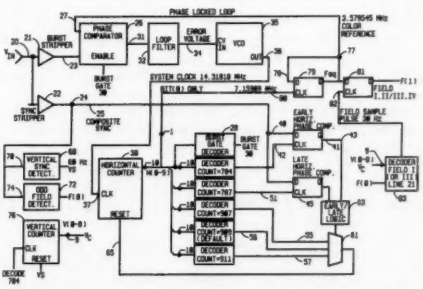


low pass filter means acting on said digital video signal having the second sampling frequency from said decimating means, said low pass filter means eliminating from said digital video signal having the second sampling frequency an undesired signal component due to the converting of the sampling rate and which appears between frequency bands of one-half of said first and second sampling frequencies, respectively.

5,068,717
METHOD AND APPARATUS FOR SYNCHRONIZATION IN A DIGITAL COMPOSITE VIDEO SYSTEM

Timothy P. Jenison, 6237 SW. 23rd St., Topeka, Kans. 66614

Filed Apr. 27, 1990, Ser. No. 515,195
Int. Cl.[5] H04N *9/44*
U.S. Cl. 358—17 **6 Claims**



1. In a digital composite video system for digitally processing a composite video signal where said video signal has a color subcarrier and burst frequency F_{sc}, horizontal sync and vertical sync signals, and horizontal scan frequency F_h, and produces four color fields I, II, II, and IV, and where the system has a system clock of frequency nF_{sc} for system purposes including digitizing the video signal, and a horizontal counter counting to L incremented by the system clock at nF_{sc} where N and L are integers, a method for synchronizing the system clock to the color burst signal such that active transitions of the system clock are in a known phase relationship to 0° and 90° points of the color burst signal and synchronizing the horizontal counter to the horizontal sync signal, comprised of the steps of:
first, locking the horizontal counter and the associated nF_{sc} system clock generator to the color burst signal such that the positive going transitions of the bit of the counter

cycling at $2F_{sc}$ are in a known phase relationship with zero crossings of the color burst signal;

second, incrementing the horizontal counter using the system clock to a pre-selected number L where L is an integer;

third, selecting a window based on a predetermined state of the horizontal counter that is (n/2)+1 system clock cycles wide during which the horizontal sync is desired to occur and then determining whether the horizontal sync occurs before, during, or after the window;

fourth, directing the counter to reset at count L−(n/2), L or L+(n/2) depending on when the horizontal sync pulse occurs in relation to the window;

fifth, sampling the color burst signal at regular intervals in order to determine which of the four color fields is being processed.

5,068,718

IMAGE QUALITY CORRECTING SYSTEM FOR USE WITH AN IMAGING APPARATUS

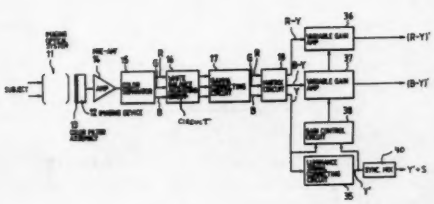
Kazuki Iwabe, Tokyo; Naoki Kubo, Kanagawa; Hiroshi Tamayama, Kanagawa; Takashi Yano, Kanagawa; Takashi Soga, and Hitoshi Koike, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

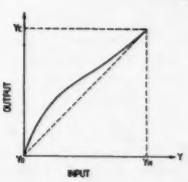
Continuation-in-part of Ser. No. 431,076, Nov. 3, 1989, abandoned. This application Mar. 20, 1990, Ser. No. 496,331

Claims priority, application Japan, Nov. 4, 1988, 1-277507; Nov. 21, 1988, 1-292285; Nov. 21, 1988, 1-292286

Int. Cl.[5] H04N *9/69*

U.S. Cl. 358—27 **18 Claims**





1. An imaging apparatus which develops a corrected luminance signal and color difference signals of an image subject comprising:

optical lens means for receiving image light emitted from said image subject in order to provide received image light;

color filter means, coupled to said optical lens means, for filtering said received image light;

photo-electric conversion means, coupled to said color filter means, for converting the filtered image light into electrical image signals;

pre-amplifier means, coupled to said photo-electric conversion means, for amplifying said electrical image signals;

color separator means, coupled to said pre-amplifier means, for separating said amplified electrical image signals into red, green and blue color signals;

white balance adjustment means, coupled to said color separator means, for adjusting the amplitude levels of said red, green and blue color signals;

matrix circuit means, coupled to said white balance adjustment means, for converting said amplitude adjusted red, green and blue color signals into a luminance signal and color difference signals;

luminance signal correction means, coupled to said matrix circuit means, for outputting a corrected luminance signal in accordance with an input-output non-linear amplification factor in response to an input luminance signal intermediate a minimum and maximum luminance level, corresponding to a darkest and lightest luminance state, respectively, and for outputting said minimum and maximum luminance levels in response to an input luminance signal corresponding to said darkest and lightest state, respectively, in order to extend and emphasize an intermediate input luminance signal; and

color difference correcting means, having fixed amplification factors, coupled to said matrix circuit means, for outputting corrected color difference signals that are subject to signal extension.

12. An image quality correcting system for use with an imaging apparatus which includes a matrix circuit for forming a luminance signal and color difference signals from color signals generated in an imaging device, comprising:

luminance signal correcting means for producing with the same linear input-output characteristic an output in response to a luminance signal input for a preset minimum luminance and another output in response to a luminance signal input for a preset maximum luminance and for producing an output in response to a luminance signal input within limits of said preset minimum and maximum luminance levels in accordance with an appropriate nonlinear input-output characteristic having a greater amplification factor than said linear input-output characteristic; and

color difference correcting means for amplifying said color difference signals by an appropriate amplification factor,

at least a new luminance signal being generated for the luminance signal formed in the matrix circuit, said new luminance signal being nonlinearly extended with the limits of said preset minimum and maximum luminance levels, and new color difference signals being generated by amplification with said appropriate amplification factor.

5,068,719

ENDOSCOPE PHOTOMETRIC APPARATUS

Kiyoshi Tsuji, Musashino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1990, Ser. No. 476,062

Claims priority, application Japan, Jun. 7, 1989, 1-144834; Sep. 22, 1989, 1-247493

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—98 **15 Claims**

1. An endoscope photometric apparatus comprising:

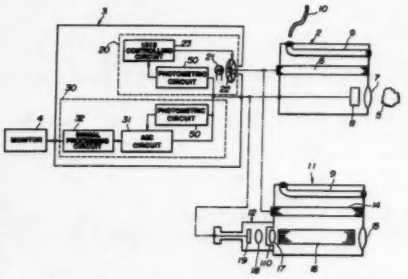
an endoscope imaging apparatus;

a photometric means, connected to said endoscope imaging apparatus, for detecting brightness of an image based on an input image signal from said endoscope imaging apparatus;

an extracting means, connected to said endoscope imaging apparatus, for extracting, from the input image signal from said endoscope imaging apparatus, a bright part of the image signal in which a difference in brightness level at a

periphery of the image is above a predetermined value and a spatial size of said bright part is below a predetermined value; and

a limiting means, connected to said endoscope imaging apparatus, said extracting means and said photometric means,



for limiting input into said photometric means of a part, corresponding to said bright part, in said image signal by using an output of said extracting means in order to reduce the influence of said bright part on the brightness of the entire image.

5,068,720

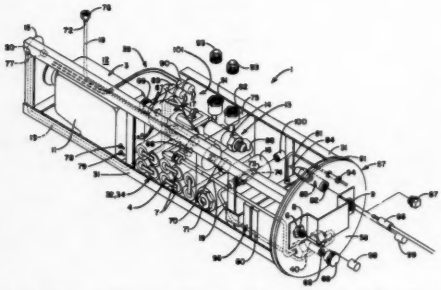
VIDEO INSPECTION SYSTEM FOR HAZARDOUS ENVIRONMENTS

Nils G. Herlitz; Karl I. Iglehart, and John S. Sentell, all of Baton Rouge, La., assignors to Safe T.V., Inc., Baton Rouge, La.

Continuation-in-part of Ser. No. 383,182, Jul. 21, 1989, Pat. No. 4,961,111. This application Oct. 2, 1990, Ser. No. 591,839

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—100 **4 Claims**



1. A Video inspection system for hazardous environments, comprising:

a. a housing, sealable so as to contain a pressurized gas therein, having a view opening therein and further including:

i. a means for introducing pressurized gas into said housing, connected to said housing; and

ii. a transparent lens, sealingly affixed across said view opening;

b. a camera means for recording visual images through said view opening, mounted within said housing and having a video output;

c. a power supply, for powering said camera means, mounted within said housing and operatively connected to said camera means; and

d. a means for converting a video signal to a light signal and transmitting said light signal, operatively connected to said video output of said camera means.

5,068,721

PROCESS AND APPARATUS FOR THE REMOTE-CONTROLLED POSITIONING OF AN INSPECTION DEVICE WITH THE AID OF A TELEVISION CAMERA ASSOCIATED WITH THE INSPECTION DEVICE

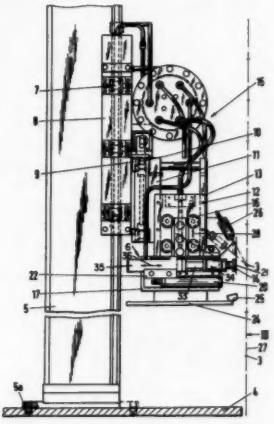
Alban Dietrich, Hassloch, Fed. Rep. of Germany, assignor to ABB Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,757

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, 3931080

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—100 **11 Claims**



1. Process for the remote-controlled positioning of an inspection device with a television camera associated with the inspection device, which comprises positioning the television camera and the inspection device parallel to each other at a given spacing and one above the other along an axis of symmetry on a carriage, moving the carriage until a marking on the television camera is aligned with a marking of an object under inspection, and moving the carriage until the television camera and the inspection device are displaced together by the given spacing along the axis of symmetry.

5,068,722

MOTION VECTOR ESTIMATING APPARATUS

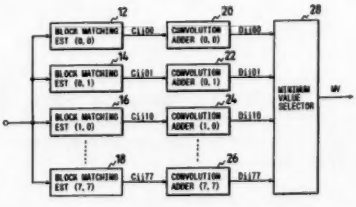
Kenji Sugiyama, Noda, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 16, 1990, Ser. No. 614,478

Claims priority, application Japan, Jan. 23, 1990, 2-13199

Int. Cl.[5] H04N *7/10, 7/12, 7/01*

U.S. Cl. 358—105 **9 Claims**



1. A motion vector estimating apparatus comprising:

a plurality of block matching estimators generating block matching values from an input video signal respectively,

wherein the block matching values represent likelihoods of motion vectors with respect to an actual motion respectively;

a plurality of convolution adders receiving the block matching values respectively, wherein each of the convolution adders provides predetermined weights to the block matching values and adds the weighted block matching values to obtain an output value; and

means for selecting a smallest value of output values from the convolution adders, and outputting a vector related to the smallest value as a final motion vector.

5,068,723

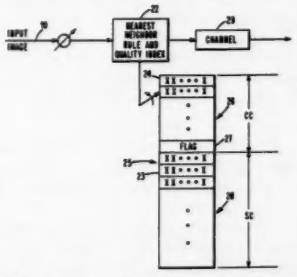
FRAME OR SUB-FRAME RATE ADAPTIVE VECTOR QUANTIZER FOR MOVING IMAGES

Sudhir S. Dixit, Norwood, and Yushu Feng, Worcester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 354,007, May 19, 1989, abandoned. This application Jul. 24, 1990, Ser. No. 557,268

Int. Cl.[5] H04N *7/12, 7/18*

U.S. Cl. 358—133 **9 Claims**



1. A method of compressing and reconstructing a sequence of image signals by adaptive vector quantization comprising the steps of:

constructing a code book having a plurality of addressable entries representing combinations of elements which have appeared frequently in previously coded images;

dividing said code book into two sections, wherein a first of said sections contains addressable entries for common characteristics of a large plurality of images, has a higher priority than a second section;

a second of said sections contains addressable entries for specific characteristics of a sequence of images, having less frequently occurring vectors and having a lower priority;

said first section containing vectors having the highest probability of occurrence;

storing said code book such that it may be used for both compression and reconstruction of the same image signals;

each of said sections being initialized to predefined sizes and states at the beginning of each coding process;

selecting a quality index which is a function of squared error distortion;

dividing each newly arriving image into blocks having N×N picture elements;

comparing each block of each newly arriving image in said sequence with entries in said first section of said code book to find a best match vector based on a distance measure;

computing a first quality measure for said block;

if said first quality measure is smaller or equal to said quality index, sending the address of said best matching vector to a receiver;

if said first quality measure is larger than said quality index, searching for a best matching vector in said second section of said code book;

computing a second quality measure for said matching vector in said second section;

if said second quality measure is larger than said first quality measure, then sending the address of said best matched vector of said first section; else

sending a special flag followed by the address of said best matched vector in said second section;

maintaining a record of frequency of usage of each vector in each section of said code book;

incrementing usage records for matched vectors in said first and second sections; and

periodically reordering said code book by swapping code vectors between said sections so that the most frequently used vectors appear in said first section.

5,068,724

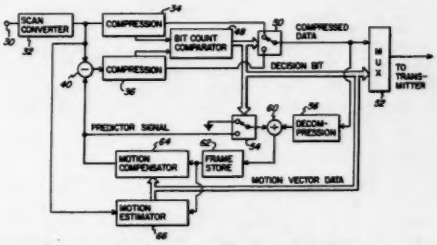
ADAPTIVE MOTION COMPENSATION FOR DIGITAL TELEVISION

Edward A. Krause, San Diego; Woo H. Paik, Encinitas; Vincent Liu, and Jim Essserman, both of San Diego, all of Calif., assignors to General Instrument Corporation, Hatboro, Pa.

Filed Jun. 15, 1990, Ser. No. 538,823

Int. Cl.[5] H04N *7/137*

U.S. Cl. 358—133 **25 Claims**



1. Apparatus for processing digital video signals for transmission in a compressed form comprising:

first means for compressing a set of pixel data to provide a first compressed video signal suitable for transmission;

second means for compressing said set of pixel data to provide a second compressed video signal suitable for transmission;

bit counter means coupled to said first means for quantifying the data in the first compressed video signal and coupled to said second means for quantifying the data in the second compressed video signal; and

comparator means coupled to said bit counter means for selecting the compressed video signal containing the least data by comparing the number of bits in said first compressed video signal to the number of bits in said second compressed video signal.

5,068,725

BAND COMPRESSING/RESTORING APPARATUS

Yoshihiko Ogawa; Seijiro Yasuki, both of Yokohama, and Kiyoyuki Kawai, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1990, Ser. No. 470,219

Claims priority, application Japan, Feb. 28, 1989, 1-45249

Int. Cl.[5] H04N *7/12, 7/18*

U.S. Cl. 358—135 **9 Claims**

1. A band compressing and restoring apparatus for compressing an input television signal, having first and second fields, to generate a band compressed signal, and for restoring the band compressed signal, the apparatus comprising:

first signal output means for receiving the input television signal, having a 2:1 interlace format, and for outputting a first television signal, every second field, comprising an average of high frequency components of the first and second fields of the input television signal;

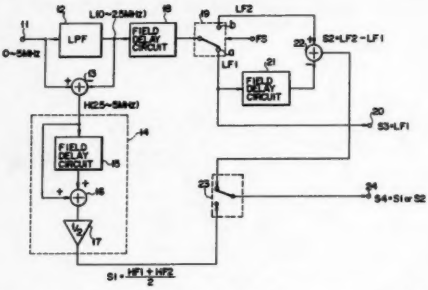
second signal output means for receiving the input television

signal and for outputting a second television signal, every first field, obtained by subtracting a low-frequency component of the first field of the input television signal from a low-frequency component of the second field of the input television signal;

third signal output means for receiving the input television signal and for outputting a third television signal, every second field, comprising only the low-frequency components of the first field of the input television signal;

fourth signal output means for receiving the first and second television signals and for outputting a fourth television signal comprising the second television, every first field, and the first television signal, every second field;

fifth signal output means for receiving the third and fourth television signals and for outputting, every second field, a fifth television signal comprising the sum of the third television signal and the second field of the fourth signal;



sixth signal output means for receiving the fourth and fifth television signals, for delaying the fifth television signal by one field, for adding the first field of the fourth television signal to the fifth television signal, and for outputting, every first field, a sixth television signal comprising the sum of the low frequency component of the second field of the input television signal and the first television signal; and

seventh signal output means for alternately selecting, every field, the fifth and sixth television signals, respectively, and for outputting a seventh television signal comprising, in a first field thereof, the sum of the low frequency component of the first field of the input television signal and the average of the high frequency components of the first and second field of the input television signal and, in a second field thereof, the sum of the low frequency component of the second field of the input television signal and the average of the high frequency components of the first and second fields of the input television signal.

5,068,726

CODING APPARATUS THAT TEMPORALLY INTERPOLATES BLOCK DATA AND SELECTS TRANSMISSION MODE

Tetsujiro Kondo, and Kenji Takahashi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1990, Ser. No. 617,806

Claims priority, application Japan, Nov. 28, 1989, 1-308225

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—135 **4 Claims**

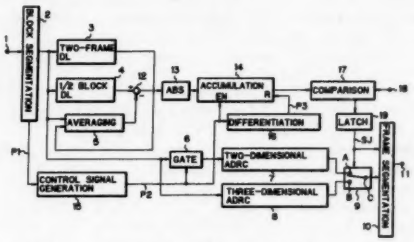
1. A highly efficient coding apparatus for coding digital video data in a format composed of blocks of digital video data representing a three-dimensional group of picture elements belonging to a plurality of fields and allowing compression of the video data,

interpolating means for interpolating digital video data in one of said plurality of fields of one block from digital video data in another of said plurality of fields of said block and for generating interpolated digital video data,

detecting means for detecting a difference between said interpolated digital video data and real digital video data,

control signal generating means for generating a control signal for said block in response to the output of said detecting means,

encoding means for encoding digital video data in said block



belonging to all of said plurality of fields in a first mode and for encoding digital video data in said block belonging to the other of said plurality of fields in a second mode,

selecting means for selecting one of said first and second modes in response to said control signal, and

transmitting means for transmitting the output of said encoding means and said control signal for each said block.

5,068,727

DEVICE FOR DECODING SIGNALS REPRESENTATIVE OF A SEQUENCE OF IMAGES AND HIGH DEFINITION TELEVISION IMAGE TRANSMISSION SYSTEM INCLUDING SUCH A DEVICE

Mohammed R. Haghiri, Sceaux; Philippe Guntzburger, Epinay-sous-Senart; Frédéric Fonsalas, Grigny, and Marcel Le Queau, Ozoir-la-Ferriere, all of France, assignors to U. S. Philips Corporation, New York, N.Y.

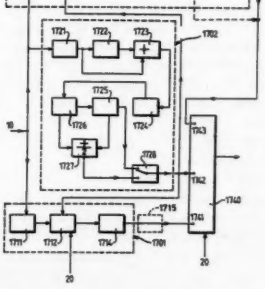
PCT No. PCT/NL89/00023, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO89/10039, PCT Pub. Date Oct. 19, 1989

PCT Filed Apr. 17, 1989, Ser. No. 458,745

Claims priority, application France, Apr. 15, 1988, 88 05010; Jun. 28, 1988, 88 08652; Jul. 8, 1988, 88 09294

Int. Cl.[5] H04N *7/12, 7/00*

U.S. Cl. 358—138 **8 Claims**



1. A decoder for use in a high definition television system wherein a plurality of images are encoded and transmitted as image data by means of a first channel having a limited passband and at a transmission rate selected from three separate transmission rates, said selected transmission rate being determined by a decision signal from a decision circuit, and wherein motion data representative of motion in said original images is

derived and transmitted together with said decision signal by means of a second channel, said decoder comprising:

a) a plurality of processing branches coupled in parallel and each receiving said image data from said first channel and providing respective processed data outputs, each of said branches comprising in series, a dynamic interpolation circuit and a spatial filtering circuit, a first said processing branch further comprising means coupled to said second channel, for reconstructing said images from said image data or said motion data, and second and third processing branches each further comprising a multiplexer having a first input coupled to the dynamic interpolation circuit of its respective branch, a second input coupled to said second channel and a third input coupled to said reconstructing means; and

b) selection means having a first input coupled to said second channel and a plurality of data inputs each coupled respectively to said processed data outputs, for selecting as a selected output one of said processed data outputs in response to said decision signal.

5,068,728

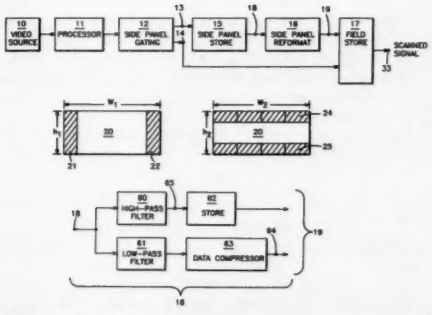
COMPATIBLE INCREASED ASPECT RATIO TELEVISION SYSTEM

Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025

Filed Jun. 22, 1990, Ser. No. 542,108

Int. Cl.[5] H04N *7/04*

U.S. Cl. 358—141 **11 Claims**



1. In a method for providing an increased aspect ratio television image using a modified signal which is compatible with standard television receivers receiving standard television signals where the increased width of the increased aspect ratio image is obtained by adding side panels on each side of a standard television image comprising the steps of:

reducing the number of active scanning lines in the standard television signal by inactivating lines which are within the viewing area of the standard television receiver; and

inserting information in the inactive scanning lines representing solely information from the side panels in a manner which substantially minimizes the visibility of these lines when viewed on a standard television receiver.

5,068,729

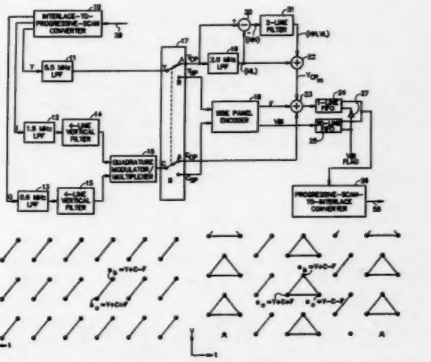
COMPATIBLE EXTENDED-DEFINITION TELEVISION

Ron D. Katznelson, and Edward A. Krause, both of San Diego, Calif., assignors to General Instrument Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 258,143, Oct. 14, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 413,881

Int. Cl.[5] H04N *7/00, 11/00*

U.S. Cl. 358—141 **15 Claims**



1. An encoder for encoding a wide-aspect-ratio television signal for transmission within a standard-television-signal-compatible format, comprising

means for dividing the television signal into center-panel segments from which the horizontally central portion of a television picture produced from said wide-aspect-ratio television signal is displayed in accordance with a standard-television-signal aspect ratio, and side panel segments from which the left and right side portions of the television picture produced from wide-aspect-ratio television signal are displayed in accordance with the wide aspect ratio;

means for arranging the center panel segments for transmission in the standard-television-signal-compatible format;

means for reducing the spatial frequency extent of at least a portion of said side-panel segments by vertically expanding said portion; and

means for inserting said vertically expanded portion of the side-panel segments for transmission during transmission of said center-panel segments in a manner that enables said inserted portion of the side panel segments to be separated from the center panel segments.

10. An encoder for encoding a video signal derived from 24-frames-per-second film for transmission, comprising

means for processing said video signal to provide luminance information Y, chrominance information C and Fukinuki-hole signals F;

means for processing the luminance information Y, chromi-

nance information C and Fukinuki-hole signals F to provide an encoded signal having composite pixels ($S=Y\pm C\pm F$), wherein the respective values of Y above a given frequency, C and F are the same in each of only three consecutive fields m of every five fields so that within two adjacent lines of each set of said three consecutive fields, $S_a=Y_m\pm C_m\pm F_m$, $S_b=Y_m\pm C_m\mp F_m$ and $S_c=Y_m\mp C_m\mp F_m$, with pixels S_a and S_c being the same pixel in every other field, with S_a and S_b being adjacent pixels in adjacent fields, and with S_c and S_b being adjacent pixels in adjacent fields, and wherein the respective values of Y above a given frequency, C and F are the same in each of two other consecutive fields n of every five fields so that within two adjacent lines of the two other consecutive fields, $S_d=Y_n\pm C_n\pm F_n$ and $S_e=Y_n\pm C_n\pm F_n$, with S_d and S_e being adjacent pixels in adjacent fields.

5,068,730

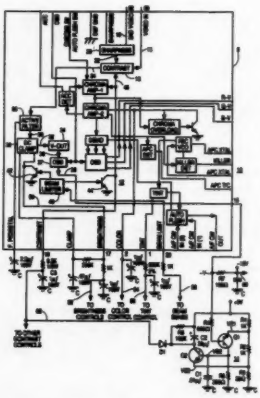
VIDEO CONTROL CIRCUIT

Gene K. Sendelweck, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 340,652, Apr. 20, 1989, abandoned. This application Jun. 26, 1990, Ser. No. 543,900

Int. Cl.[5] H04N *5/57, 5/59*

U.S. Cl. 358—169 **40 Claims**



1. An anti-blister circuit for protecting a shadow mask on a cathode ray tube, the circuit comprising:

first means for detecting amplitude excursions of a signal related to luminance beyond a white level threshold during each horizontal scan;

second means, responsive to the first means, for developing a first control signal related to a minimum duration of each said amplitude excursion of the signal beyond the threshold; and,

third means responsive to the first control signal for developing a second control signal to reduce beam current during each said minimum duration amplitude excursion and to permit the beam current to increase after termination of each said minimum duration amplitude excursion.

5,068,731

VIDEO IMAGE ENLARGEMENT AND REDUCTION SYSTEM AND METHOD

Kesatoshi Takeuchi, Suwa, Japan, assignor to Seiko Epson Corporation, Japan

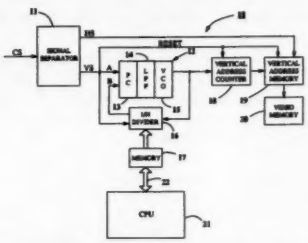
PCT No. PCT/JP89/00665, § 371 Date Apr. 30, 1990, § 102(e) Date Apr. 30, 1990, PCT Pub. No. WO90/00789, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 3, 1989, Ser. No. 465,247

Claims priority, application Japan, Jul. 14, 1988, 63-176037

Int. Cl.[5] H04N *3/223, 7/01, 5/04*

U.S. Cl. 358—180 **10 Claims**



1. A video sweep synchronizing and address system having inputs to receive horizontal and vertical sweep synchronizing signals associated with a video signal, the system comprising:

a phase locked loop having a two-input phase comparator that controls a voltage controlled oscillator, a first input to the phase comparator connected to the vertical sweep input of the system;

a digital divider receiving at its input a first signal from the output of voltage controlled oscillator, the output of the digital divider connected to a second input to the phase comparator, the digital divider able to divide by an integer quantity "n";

a vertical address counter receiving at its input a second signal from the output of voltage controlled oscillator;

a vertical sweep circuit such that the vertical dimension of an image can be controlled by adjusting the integer quantity "n";

a vertical address memory that receives a count value from the vertical address counter and is connected to the horizontal sweep input of the system such that count values are stored in synchronism with the horizontal sweep input the vertical address memory having means to output a vertical address value for use by the vertical sweep circuit; and

a video memory connected to receive data from the vertical address memory.

5,068,732

VIDEO DISPLAY APPARATUS

Yutaka Satoh, Nagoya, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1990, Ser. No. 616,195

Claims priority, application Japan, Nov. 24, 1989, 1-303107

Int. Cl.[5] H04N *3/223, 6/262*

U.S. Cl. 358—180 **10 Claims**

1. A display apparatus comprising:

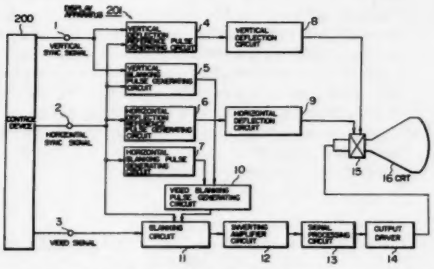
display means;

means for receiving a vertical synchronization (sync) signal, a horizontal sync signal, a video signal, in synchronism with the vertical sync signal and the horizontal sync signal, having a prescribed display area;

deflection signal generating means for generating a deflection signal on the basis of the received vertical sync signal and horizontal sync signal and supplying the deflection signal thus generated to said display means;

video signal adding means for adding an additional video signal outside of said display area of said received video

signal on the basis of said vertical sync signal and said horizontal sync signal so that the display area is expanded,



and supplying the video signal thus formed to said display means.

5,068,733

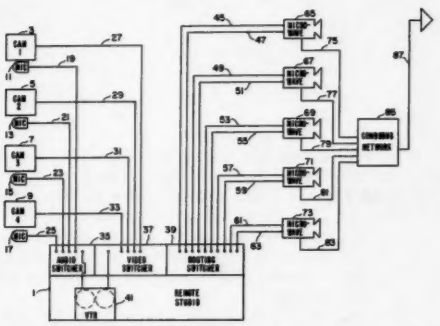
MULTIPLE ACCESS TELEVISION

Richard H. Bennett, Rte. 3, Rutledge Lake Rd., Greenville, S.C. 29611

Continuation of Ser. No. 497,754, Mar. 20, 1990, abandoned, which is a continuation of Ser. No. 394,312, Aug. 11, 1989, abandoned, which is a continuation of Ser. No. 243,901, Sep. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 84,339, Aug. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 923,344, Oct. 27, 1986, abandoned. This application Feb. 19, 1991, Ser. No. 658,416

Int. Cl.[5] H04N *5/262, 5/268, 7/12*

U.S. Cl. 358—181 **1 Claim**



1. A process for broadcasting live televised programs comprising:

obtaining video signals from a plurality of video cameras, each of said cameras relaying a different selected and predetermined view of a single event or production;

producing an audio signal associated with said event or production;

receiving said video signals and said audio signal in a remote studio;

transmitting for broadcast through a single combining network said audio signal and all said video signals simultaneously to a radiating antenna;

broadcasting the combined signals from said radiating antenna;

receiving said combined and broadcasted signals by a receiving antenna in communication with a cable television distribution system; and

re-transmitting said audio signal and all said video signals on a cable television distribution system where by each of a plurality of subscribers to the cable television distribution system may select any one of the video options made available by a broadcasting network.

5,068,734

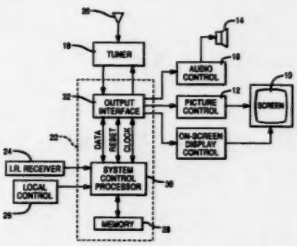
APPARATUS FOR CONTROLLING A TELEVISION RECEIVER

Jack Beery, 907 6th St. SW., Apt. 815 C, Washington, D.C. 20024

Filed May 31, 1989, Ser. No. 359,155

Int. Cl.[5] H04N *5/50*

U.S. Cl. 358—191.1 **28 Claims**



1. In a television control system apparatus for selecting a television channel corresponding to a preassigned channel tuning designation, the system apparatus comprising:

tuner means for receiving a processor signal and a multichannel input signal, and in response to said processor signal, tuning out all but one channel corresponding to a selected one of said preassigned channel tuning designations;

memory means for storing at least one operator-assigned channel select designation for at least one of said channel tuning designations;

operator-actuated control means for generating a control output signal comprising one of (a) a first data set representative of a desired channel select designation for one of said channel tuning designations, and (b) a second data set representative of a desired viewing channel identified by an operator selected one of said channel select designations;

processor means for receiving said control output signal from said operator-actuated control means, and upon receipt of said first data set, causing said memory means to store said desired channel select designation as corresponding to said one channel tuning designation, and upon receipt of said second data set, retrieving from said memory means the one of said channel tuning designations corresponding to said operator selected channel select designation, and generating said processor signal to correspond to said one channel tuning designation.

5,068,735

SYSTEM FOR CONTROLLING THE AIMING DIRECTION, FOCUS, ZOOMING, AND/OR POSITION OF A TELEVISION CAMERA

Kazumichi Tuchiya; Nobuhara Nagashima; Masayoshi Wasada, and Akihiro Suzuki, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Oomiya, Japan

Filed Aug. 13, 1990, Ser. No. 566,736

Claims priority, application Japan, Aug. 22, 1989, 1-215358

Int. Cl.[5] H04N *5/30*

U.S. Cl. 358—209 **2 Claims**

1. A system for controlling the aiming direction, focus, zooming and/or position of a television camera, comprising:

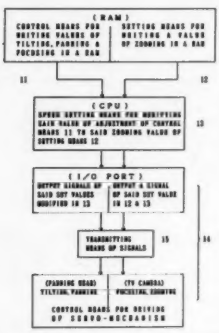
a control box having a plurality of control switches and a microcomputer;

a first means for changing the vertical and horizontal direction of a panning head on which a television camera is mounted and the focal distance of said television camera

in response to operation of predetermined control switches provided in said control box and for writing values of adjustment resulting from these changes into said microcomputer;

a second means for setting a value of zooming of said television camera by operation of a predetermined control switch provided on said control box and writing a value of adjustment resulted from this setting into said microcomputer;

a speed setting means for modifying said values of adjustment at which the vertical and horizontal orientations of the panning head and the focal distance of said television camera are to be adjusted by said first means, depending



upon the value of adjustment obtained by setting said value of zooming;

a means for controlling a zooming servo-mechanism of said television camera by delivering from said microcomputer a control signal corresponding to the value of zooming set with said second means and for controlling a tilting servo-mechanism and panning servo-mechanism of said panning head as well as a focusing servo-mechanism of said television camera with a control signal from said speed setting means; and

a means for transmitting control signals between the driving mechanisms provided for said panning head and television camera, respectively, and the control box.

5,068,736

SOLID STATE IMAGING DEVICE WHICH HAS A SHORT TIME CONSTANT WHICH IS SHORTER THAN THE APPLICATION OF A PULSE VOLTAGE UNTIL THE END OF THE BLANKING PERIOD

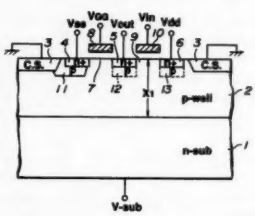
Masaharu Hamasaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,740

Claims priority, application Japan, Sep. 20, 1988, 63-235445

Int. Cl.[5] H04N *5/335*

U.S. Cl. 358—213.13 **5 Claims**



1. A solid state imaging device for carrying out electronic shuttering in a blanking period, comprising:

a first conductivity type semiconductor substrate being applied a pulse voltage for electronic shuttering,

a second conductivity type semiconductor region formed on said first conductivity type semiconductor substrate said second semiconductor region having an impurity concentration of $10^{15}cm^{-2}$ or lower and depth of junction in the order of 5μm such that the time constant defined by the resistance and the parasitic capacitance of said second conductivity semiconductor region is shorter than a period which elapses between the application of said pulse voltage until the expiration of the blanking period,

an output circuit having a field effect transistor, and a channel of said field effect transistor formed in said second conductivity type semiconductor region.

5,068,737

IMAGE SENSOR HAVING MULTIPLE PAIRS OF ARRAY SENSORS

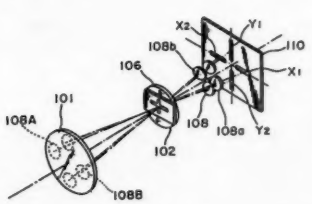
Nobuyuki Taniguchi, Nishinomiya; Toshihiko Karasaki, Sakai; Tokuji Ishida, Daito; Masataka Hamada, Minamikawachi, and Toshio Norita, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 578,081, Sep. 5, 1990, abandoned, which is a division of Ser. No. 353,813, May 18, 1989, Pat. No. 4,979,045, which is a division of Ser. No. 5,413, Jan. 20, 1987, Pat. No. 4,835,615. This application Feb. 13, 1991, Ser. No. 656,107

Claims priority, application Japan, Jan. 21, 1986, 61-11537; Mar. 14, 1986, 61-57855

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—227 **37 Claims**



1. A focus condition detecting device for detecting the focus condition of an image of an object, comprising:

a plurality of pairs of arrays of sensor elements for receiving images of a plurality of separate portions of an object, said arrays in each pair aligned along an axis corresponding to a separate portion of the object, and the respective axes of each pair of arrays being offset from an axis of another pair of arrays, and

a detecting means for detecting a focus condition for each separate portion of the object based on a mutual positional relationship between images of the same separate portion of the object formed on each pair of arrays.

5,068,738

PHASE-DIFFERENCE DETECTOR USING AN ANALOG ARITHMETIC CORRELATION DEVICE

Takashi Miida, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 10, 1989, Ser. No. 321,851

Claims priority, application Japan, Mar. 10, 1988, 63-54786

Int. Cl.[5] G01J *1/20*

U.S. Cl. 358—227 **2 Claims**

1. A phase-difference detector for discriminating a focusing state of an objective lens by detecting relative positions of a pair of optical images from an optical axis comprising:

sensor means for sensing the pair of optical images and sequentially outputting a first analog signal corresponding to one of the pair of optical images and a second analog

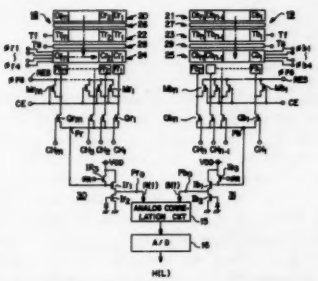
signal corresponding to another of the pair of optical images at predetermined intervals in a non-destructive manner and for shifting phases of said first and second analog signals with respect to each other, said first and second analog signals being generated by photoelectric conversion of said pair of optical images;

analog correlation arithmetic means, operatively connected to said sensor means, for performing an analog correlation arithmetic operation to obtain analog correlative values from said first and second analog signals outputted from said sensor means; and

an A/D converter, operatively connected to said analog correlation arithmetic means, for converting said analog correlative values outputted from said analog correlation arithmetic means into digital correlative values;

said sensor means including,

a first light receiving unit essentially consisting of a group of photoelectric conversion elements arrayed to optically receive one of the pair of optical images and outputting first charge signals corresponding to charges induced in said first light receiving unit,



a first signal readout unit, operatively connected to said first light receiving unit, for transferring said first charge signals in a predetermined array-direction and for outputting said first analog signals corresponding to said first charge signals in parallel through floating gates,

a second light receiving unit essentially consisting of a group of photoelectric conversion elements arrayed to optically receive another of the pair of optical images and outputting second charge signals corresponding to charges induced in said second light receiving unit,

a second signal readout unit, operatively connected to said second light receiving unit, for transferring said second charge signals in a predetermined array-direction and for outputting said second analog signals corresponding to said second charge signals in parallel through floating gates, and

control means, operatively connected to said first and second signal readout units, for outputting at predetermined intervals both said first and second analog signals out of phase with each other.

5,068,739

METHOD TO IMAGE TRANSPARENT MEDIA UTILIZING INTEGRATED SCANNING

Andrew Filo, Cupertino, Calif., assignor to Optum Corporation, Cupertino, Calif.

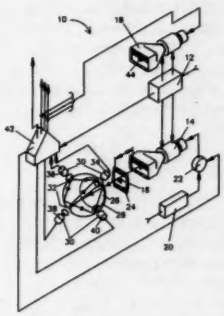
Filed Feb. 10, 1989, Ser. No. 309,099

Int. Cl.[5] H04N *5/74, 7/18;* G03F *3/10*

U.S. Cl. 358—237 **21 Claims**

1. A device to scan and display images contained in transparent media (transparencies) comprising:

integrated scanning means including a feedback loop whereby scanning of an image and regulation of the displayed image can be performed simultaneously without



the need for lensatic optics; and NTSC video circuit; and display means.

5,068,740

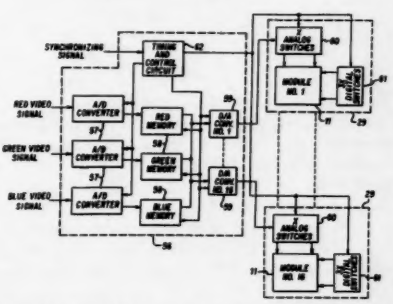
MODULAR FLAT-SCREEN TELEVISION DISPLAYS AND MODULES AND CIRCUIT DRIVES THEREFOR

Thomas P. Brody, Pittsburgh, Pa., assignor to Magnascreen Corporation, Pittsburgh, Pa.

Division of Ser. No. 222,523, Jul. 21, 1988. This application Feb. 23, 1990, Ser. No. 484,577

Int. Cl.[5] H04N *9/30;* H05B *37/00*

U.S. Cl. 358—241 **14 Claims**



1. A module for a flat-screen television display comprising:

A. a substrate with first and second major surfaces and edge surfaces and being capable of transmitting light;

B. a matrix of conductive pads capable of defining picture elements and extending over the first major surface of the substrate in a regular pattern with boundary conductive pads adjacent the edge surfaces of the substrate to distances such that the regular pattern is capable of continuing substantially uninterrupted when a similar module is positioned adjacent to said module;

C. a matrix of electrical switching elements extending over the first major surface of the substrate with each said switching element capable of activating one of said conductive pads upon receiving electrical signals through both row and column conductive strips;

D. said row and column conductive strips each extending over the first major surface from adjacent an edge surface to adjacent an opposite edge surface of the substrate such that each said switching element can be electrically activated by a row conductive strip and a column conductive strip;

E. a frame positioned adjacent an extension of said edge surfaces of the substrate and capable of allowing light to be transmitted through the substrate;

F. an electrical drive circuit positioned adjacent the second major surface of the substrate and being capable of electrically activating the switching elements in correspondence to desired visual images to be formed by the picture elements over the first major surface; and

G. interconnecting conductors adjacent the edge surfaces of the substrate and the frame electrically connecting the drive circuit with the row and column conductive strips on the first major surface of said substrate and electrically insulated from similar interconnecting conductors of adjacent modules.

5,068,741

IMAGE OUTPUT APPARATUS FOR REPRODUCING, ADJACENT EACH OTHER, LEADING IMAGE DATA PORTIONS OF PLURAL IMAGE UNITS

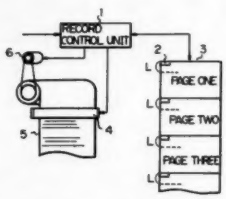
Masatomo Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 117,415, Nov. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 704,934, Feb. 25, 1985, abandoned. This application Sep. 26, 1989, Ser. No. 412,605

Claims priority, application Japan, Feb. 29, 1984, 59-36301; Feb. 29, 1984, 59-36302

Int. Cl.[5] H04N *1/21, 1/23;* **G06F** *3/12*

U.S. Cl. 358—296 **12 Claims**



1. An image output apparatus comprising:

an image memory for storing image data corresponding to a plurality of unit images, the image data of each unit image including a leading portion;

readout means for reading out the image data stored in said image memory;

control means for controlling said readout means such that said readout means sequentially reads out a part of the image data of each unit image from said image memory; and

reproduction means for reproducing, adjacent each other, parts of respective unit images of the image data read out by said control means through said readout means such that these parts can be displayed simultaneously,

wherein said control means controls said readout means so as to read out the leading portion of the image data of each unit image.

5,068,742

APPARATUS FOR MAKING BOOKLETS WITH PHOTOGRAPHS

Yuji Oshikoshi; Yoshimi Suganuma, both of Tokyo; Hiroshi Hara, Kanagawa; Kazuo Shiota, Kanagawa; Nobumitsu Takehara, Kanagawa, and Kiichiro Sakamoto, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 261,299, Oct. 24, 1988. This application Jan. 30, 1990, Ser. No. 472,140

Claims priority, application Japan, Oct. 23, 1987, 62-267847; Oct. 23, 1987, 62-267848; Oct. 26, 1987, 62-269935

Int. Cl.[5] B42D *15/10;* **G03B** *27/465, 27/58;* **G03D** *3/13*

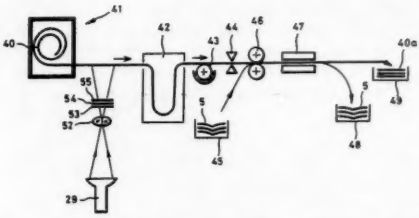
U.S. Cl. 358—296 **9 Claims**

1. An apparatus for making a personal booklet having a picture and personal data of the booklet holder for providing the booklet holder's identity, the apparatus comprising:

a cassette containing therein a photosensitive paper;

composite image forming means for receiving a first input comprising said picture and a second input comprising said personal data of said booklet holder, and for forming a composite image of said picture and said personal data of said booklet holder;

exposure means for exposing said photosensitive paper to said composite image of said picture and said personal data of the booklet holder, said composite image being exposed in its entirety to said photosensitive paper in a single operation;



a container containing therein booklets, each booklet having a page formed with an image receiving layer;

superimposing means for superimposing said image receiving layer of each of said booklets picked up from said container and said exposed photosensitive paper to thereby force out air of said superimposed image receiving layer and exposed photosensitive paper; and

a thermal printing head for heating said superimposed image receiving layer and exposed photosensitive paper to transfer said composite image from said photosensitive paper to said image receiving layer.

5,068,743

FACSIMILE RECORDING APPARATUS WITH PAGE CUTTING OR CONTINUOUS FEED MODE DEPENDING ON MODE SETTING OR ON NUMBER OF PAGES TO BE RECEIVED

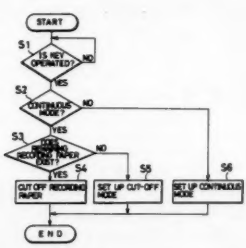
Shigeharu Araki, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1990, Ser. No. 494,223

Claims priority, application Japan, Mar. 17, 1989, 1-66739; Mar. 17, 1989, 1-66740; Mar. 17, 1989, 1-66741

Int. Cl.[5] H04N *1/23;* **B41J** *11/66*

U.S. Cl. 358—304 **4 Claims**



1. A facsimile apparatus, comprising:

network control means for controlling a transmission and reception of image data through a signal line in communication with another facsimile apparatus;

mode setting means for setting a mode of operation of said facsimile apparatus either in a cut-off mode, in which a

recording paper on which received image data is being recording is to be cut off page by page and discharged, or in a continuous mode, in which the recording paper is to be continuously discharged without being cut off at each page;

cut-off control means for generating a cut-off signal on receipt by said network control means of a signal indicating that the reception of image data from said another facsimile apparatus has been completed for each page of said image data, when said cut-off mode has been set, and for generating a cut-off signal on receipt by said network control means of a signal indicating that the reception of all image data from said another facsimile apparatus has been completed when said continuous mode has been set; and

cut-off means for cutting off the recording paper in response to said cut-off signal.

5,068,744

PICTURE DATA COMPRESSING AND RECORDING APPARATUS FOR RECORDING COMPONENTS OF THE PICTURE INDEPENDENTLY

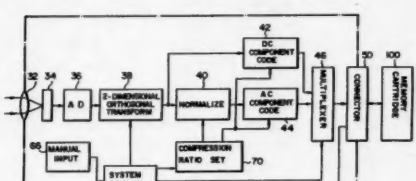
Kenji Ito, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1989, Ser. No. 407,293

Claims priority, application Japan, Oct. 14, 1988, 63-257076; Mar. 6, 1989, 1-51869

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—310 **13 Claims**



1. A data compressing and recording apparatus for dividing digital picture data which constitute a single picture into a plurality of blocks, applying a two-dimensional orthogonal transform coding to the picture data of individual blocks, and recording the coded picture data in a recording medium, said apparatus comprising:

orthogonal transforming means for applying a two-dimensional orthogonal transformation to a plurality of blocks of digital picture data;

said orthogonal transforming means individually transforming DC components and AC components of said digital picture data to produce transformed DC component data and transformed AC component data;

normalizing means for normalizing at least said transformed AC component data of the data transformed by said orthogonal transforming means;

coding means for coding, from among the data transformed by said orthogonal transforming means and the data normalized by said normalizing means, at least the normalized data; and

control means for controlling said normalizing means and said coding means;

said control means controlling an order of normalizing and coding of said transformed DC component data and said transformed AC component data of said digital picture data;

said control means controlling a recording of the DC component data and the AC component data in the recording medium such that the DC component data is recorded prior to the AC component data.

5,068,745

IMAGE FILING METHOD

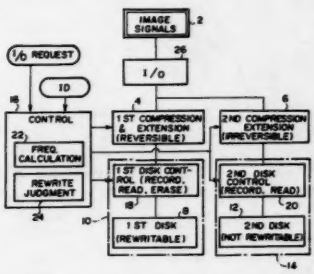
Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1990, Ser. No. 501,221

Claims priority, application Japan, Apr. 3, 1989, 1-84308

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—403 **11 Claims**



1. An image filing method comprising the steps of:

i) subjecting original image signals to a first signal compression processing which is carried out with a small factor of compression,

ii) recording the compressed image signals, which are obtained from said first signal compression processing, on a first recording medium,

iii) when a predetermined period has elapsed after a compressed image signal obtained from said first signal compression processing was recorded on said first recording medium, or when the frequency with which said compressed image signal is read from said first recording medium has become lower than a predetermined value, reading out said compressed image signal from said first recording medium,

iv) subjecting the image signal, which has been read out from said first recording medium, to a second signal compression processing which is carried out with a large factor of compression,

v) recording the compressed image signal, which is obtained from said second signal compression processing, on a second recording medium, and

vi) thereafter erasing said compressed image signal, for which said predetermined period has elapsed after it was recorded on said first recording medium or for which said frequency has become lower than said predetermined value, from said first recording medium.

5,068,746

IMAGE PROCESSING APPARATUS

Hidefumi Ohsawa, Kawaguchi; Akihiro Katayama, Kawasaki; Hiroshi Hosokawa, Yokohama; Izuru Sunohara, Ichikawa, and Masahiko Yoshimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 137,439, Dec. 23, 1987, Pat. No. 4,876,610. This application Aug. 17, 1989, Ser. No. 394,865

Claims priority, application Japan, Dec. 25, 1986, 61-313168; May 21, 1987, 62-122611

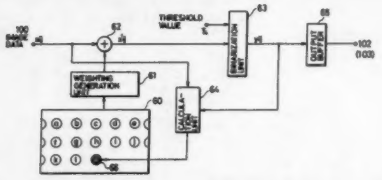
Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—443 **4 Claims**

1. An image processing apparatus comprising:

Input means for inputting first and second color image signals; binarizing means for binarization-processing each of the first and second color image signals respectively input by said input means and producing first and second color binary signals; and output means for outputting a color

image on the basis of the first and second color binary signals produced in response to the binarization-processing of said binarizing means, and of the first and second binary signals corresponding to each of the first and second color image signals, wherein said binarizing means further comprises correction means for correcting an error generated in the binarization-processing of the input first and second color image signals, and wherein said



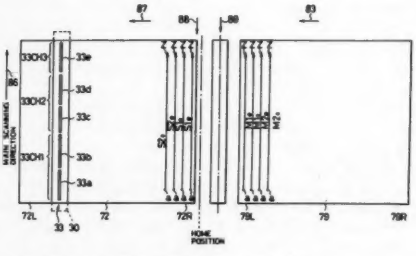
correction means calculates a difference between a value of the first color image signal and a value of the binarization-processed first color binary signal and wherein said correction means calculates a difference between a value of the second color image signal and a value of the binarization-processed second color binary signal, and performs predetermined weighting for the respective differences and adds weighted data to succeeding first and second color image signals to be input.

5,068,747

IMAGE READING APPARATUS

Makoto Nonoyama, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 151,489, Feb. 2, 1988, abandoned. This application Jan. 10, 1990, Ser. No. 462,980
Claims priority, application Japan, Feb. 3, 1987, 62-022943
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 **6 Claims**



1. An image reading apparatus comprising:

a moved manuscript mounting member for mounting a moved manuscript;

a first moved manuscript transporting means for transporting the moved manuscript from the moved manuscript mounting member, the first moved manuscript transporting means being positioned at a leading end of the moved manuscript mounting member along a transportation direction of the moved manuscript;

a second moved manuscript transporting means for transporting the moved manuscript from the first moved manuscript means to a first reading position;

optical reading means for optically reading the moved manuscript in the first reading position, the optical reading means optically reading first subdivided image lines of the moved manuscript, and producing first image data of the moved manuscript and also optically reading second subdivided image lines of the moved manuscript that are alternately arranged with respect to the first subdivided image lines and producing second image data of the moved manuscript;

a fixed manuscript mounting member with a manuscript cover for mounting a fixed manuscript in conjunction with a first surface of the manuscript cover, the manuscript cover being positioned at a delivery side of the moved manuscript in the transportation direction of the moved manuscript;

a second reading position wherein the optical reading means optically reads the fixed manuscript mounted on the fixed manuscript mounting member, the second reading position being located within the delivery side and adjacent the first reading position;

a third moved manuscript transporting means for delivering the moved manuscript from the second moved manuscript transporting means to a second surface of the manuscript cover, the third moved manuscript transporting means being located between the second moved manuscript transporting means and the fixed manuscript mounting member;

memory means for storing, in a predetermined writing address sequence, the first image data and the second image data of the moved manuscript; and

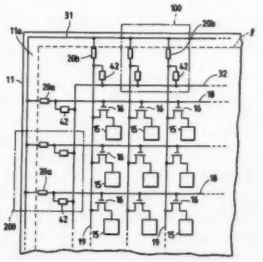
data reading means for electronically reading the first image data and the second image data from the memory means, the data reading means electronically reading in a predetermined reading address sequence that is the reverse of the predetermining writing address sequence.

5,068,748

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE HAVING IMPROVED ELECTROSTATIC DISCHARGE PROTECTION

Yasuhiro Ukai, Kobe; Tomihisa Sunata, Miki; Teizou Yukawa, and Toshiya Inada, both of Kobe, all of Japan, assignors to Hosiden Corporation, Osaka, Japan

Filed Oct. 16, 1990, Ser. No. 598,199
Claims priority, application Japan, Oct. 20, 1989, 1-273420
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—59 **7 Claims**



1. In an active matrix liquid crystal display device which has, on a transparent base plate, a plurality of equally-spaced-apart source and gate buses formed at right angles to each other, thin film transistors each connected to said source and gate buses at their intersecting point and formed at a corner in a pixel region defined by said intersecting source and gate buses, pixel electrodes each connected to one of said thin film transistors and formed over a wide area in said pixel region, and source and gate bus terminals connected to said source and gate buses at one end thereof, respectively, and formed along marginal edges of said transparent base plate, the improvement comprising:

an internal short circuiting bus formed on said transparent base pate across said source and gate buses outside of a display region containing said thin film transistors and said pixel electrodes both arranged in a matrix form but inside of arrays of said source bus terminals and said gate bus terminals;

an external short circuiting bus formed on said transparent base plate outside of and along said arrays of said source and gate bus terminals, said source and gate bus terminals being connected to said external short circuiting bus; and

coupling elements each formed of a high resistance material on said transparent base plate in the vicinity of each said intersecting point of said source and gate buses, for electrically interconnecting said source and gate buses;

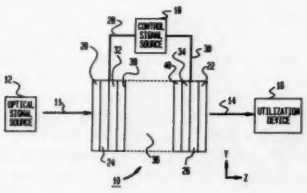
each of said coupling elements including a semiconductor layer region formed simultaneously with a semiconductor layer of each of said thin film transistors, said semiconductor layer region being formed across each of said source and gate buses widthwise thereof, a gate insulating film formed on said semiconductor layer region common to all of said thin film transistors, and a hole formed in said gate insulating film overlying said semiconductor layer region, said internal short circuiting bus being connected to said semiconductor layer region through said hole and extending on said gate insulating film.

5,068,749

ELECTRONICALLY TUNABLE POLARIZATION-INDEPENDENT LIQUID CRYSTAL OPTICAL FILTER

Jayantilal S. Patel, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 31, 1990, Ser. No. 577,220
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—93 **8 Claims**



8. An optical communication system comprising

an optical filter including

spaced-apart planar mirrors,

and a layer of a liquid crystal material in the space between said mirrors, said material comprising molecules each having a principal axis, said material having a twist of $n\pi/2$ of the principal axes of said material across said space, where n is a positive odd integer,

an input source for applying randomly polarized multiple-wavelength optical signals to said filter,

a source for applying electrical control signals to said filter to establish an electric field across said space to untwist the molecules in a central portion of said layer, the values of said signals being selected to control the electro-optic properties of said filter to pass corresponding respective ones of said input wavelengths,

and a utilization device positioned to recieve optical signals passed by said filter.

5,068,750

CONTAMINANT REMOVAL FROM TELESCOPE OPTICAL ELEMENTS

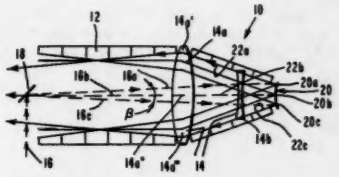
Lacy G. Cook, El Segundo, and Bryce A. Wheeler, Mammoth Lakes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 22, 1990, Ser. No. 600,956
Int. Cl.[5] G02B *23/00*; B08B *7/00*
U.S. Cl. 359—399 **20 Claims**

1. In a telescope having baffles and telescope structures, an entrance aperture, a shutter and optical means positioned between the entrance aperture and the shutter, an apparatus for removing contaminants from the optical means without illumination or heating of, or damage to the baffles and telescope structures, comprising:

a reflector positioned on or adjacent to the shutter; and

means for directing a laser beam through the entrance aperture from outside the telescope to said reflector,



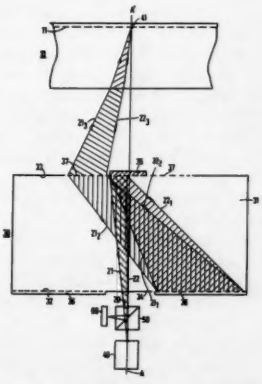
said reflector and said directing means having a cooperative opto-mechanical arrangement which enables both cleaning of the optical means and reflection of the beam on a return path back from said reflector through the entrance aperture and to the outside of the telescope without illumination or heating of, or damage to the baffles and telescope structures.

5,068,751

THREE ELEMENT GRATING OBJECTIVE AND GRATING-BEAM SHAPER, AND OPTICAL SCANNING DEVICE

Josephus J. M. Braat, and Willem G. Opheij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1990, Ser. No. 570,242
Claims priority, application Netherlands, Nov. 2, 1989, 8902706; Dec. 7, 1989, 8903013
Int. Cl.[5] G02B *5/18*
U.S. Cl. 359—566 **21 Claims**



16. A beam shaper for reshaping a beam having an elliptic cross-section to a beam having a circular-symmetrical cross-section, characterized by a system of at least three gratings which are arranged one behind the other in a path of a beam, the gratings being adapted in such a way that an axial ray and a border ray of the beam are interchanged or switched two at least times, while the gratings are one-dimensional gratings.

5,068,752

APPARATUS FOR RECORDING/REPRODUCING A DIGITAL AUDIO SIGNAL WITH A VIDEO SIGNAL

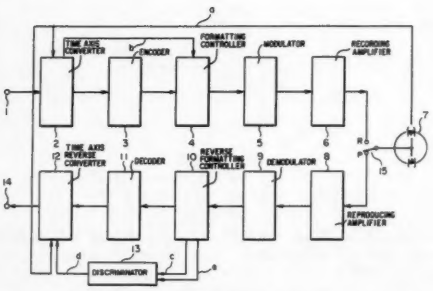
Hiroshi Tanaka, Moriguchi; Tetsuo Ishiwata, Suita; Shuzo Hitotsumachi, Yawata; Hitoshi Komae, Osaka; Susumu Yamaguchi, Moriguchi; Tadashi Yoshino, and Eiji Yamauchi, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 26, 1988, Ser. No. 248,799

Claims priority, application Japan, Sep. 29, 1987, 62-245107; Oct. 7, 1987, 62-252892; Nov. 24, 1987, 62-296933

Int. Cl.[5] H04N *5/782*

U.S. Cl. 360—32 11 Claims



1. A digital signal recording/reproducing apparatus, comprising:

a time axis converter for receiving a digital information signal having a specific sampling frequency, sectioning the digital information signal by a predetermined period related to a vertical synchronization signal of a video signal to form the digital information signal of each predetermined period into a data frame having one of more than two different numbers of samples, adding a plurality of dummy data to a data frame having a smaller number of samples so that the number of samples matches the number of samples of a data frame having a maximum number of samples and producing a rate discrimination signal to represent the number of samples of the digital information signal in one data frame;

an encoder for receiving the data output of the time axis converter and encoding the data output with a predetermined error correction;

a formation controller for adding a header word including a synchronization signal and the rate discrimination signal to each of m data blocks in one data frame of the data output of said encoder;

a recorder including a modulator for modulating the output of said formatting controller with a predetermined modulation rule; and

a reproducer including a demodulator for reversely processing to the functions of said recorder, a reverse formatting controller, a decoder and a time axis reverse converter;

the output of said recorder being recorded by a tape recorder rotating in synchronizing with the vertical synchronization signal of the video signal, and reproduced by said reproducer.

5,068,753

DATA REPRODUCING CIRCUIT FOR MEMORY SYSTEM HAVING AN EQUALIZER GENERATING TWO DIFFERENT EQUALIZING SIGNALS USED FOR DATA REPRODUCTION

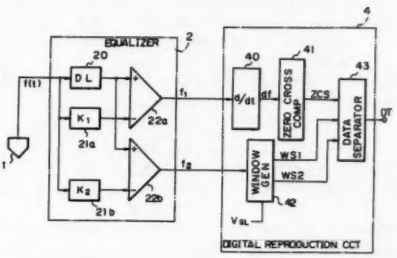
Masahide Kanegae, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 15, 1989, Ser. No. 323,943

Claims priority, application Japan, Mar. 16, 1988, 63-62769; Mar. 16, 1988, 63-62770

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—46 11 Claims



1. A data reproducing circuit for a memory system having a data sensing head, comprising:

an equalizer, operatively connected to receive an analog signal from the data sensing head, varying an amplitude of said analog signal in accordance with a predetermined time, and generating first and second equalized signals from said analog signal, said equalizer including a delay circuit, first and second gain circuits and first and second differential amplifier circuits, said delay circuit and said first gain circuit being connected to a separate input terminal of said first differential amplifier, and said delay circuit and said second gain circuit being connected to a separate input terminal of said second differential amplifier circuit; and

a digital data reproducing circuit, operatively connected to said equalizer, for receiving said first and second equalized signals, for differentiating said first equalized signal, for generating a window signal when and during a time said second equalized signal is greater than a predetermined threshold level, and for outputting a pulsed reproduction signal when said differentiated signal is greater than a predetermined level and said window signal exists.

5,068,754

METHOD AND APPARATUS FOR MEASURING BIT SHIFT

Lawrence Garde, Bloomington, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 22, 1989, Ser. No. 440,662

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—45 22 Claims

1. An apparatus for testing peak shift in a magnetic storage system comprising:

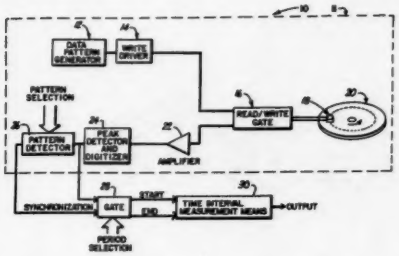
means for writing a data pattern on a magnetic medium;

means for reading data from the magnetic medium and providing a read signal;

means for detecting points of maximum differential in the read signal and providing digital pulses related to the detected points of maximum signal differential on a detector output line;

pattern detection means connected to the output line of the means for detecting points of maximum differential in the read signal for recognizing one pattern in the digital pulses on the detector output line and producing a synchronizing pulse at a fixed interval with respect to a particular pulse in the data pattern each time the pattern is detected;

gate means connected to the means for detecting points of maximum differential for providing a representation of a



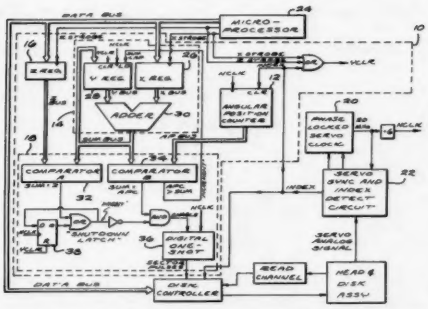
beginning and end of a period between a pair of the digital pulses on the detector output line.

5,068,755

SECTOR PULSE GENERATOR FOR HARD DISK DRIVE ASSEMBLY

Robert G. Hamilton, Canoga Park, and Robert J. Coombes, Moorpark, both of Calif., assignors to Micropolis Corporation, Chatsworth, Calif.

Filed Jun. 1, 1990, Ser. No. 532,280
Int. Cl.[5] G11B *15/18, 5/012, 5/55*
U.S. Cl. 360—72.1 **19 Claims**



1. For use in a hard disk drive assembly having a microprocessor, a plurality of hard disks for storing digital information, each of said hard disks configured to store information in a plurality of circular tracks with said tracks being divided into sectors, a circuit for generating high frequency pulses synchronized to the rotation of said disks, and a circuit for generating an index signal at a predetermined angular orientation of said disks, a sector pulse generator comprising:

an angular position counter having an angular position register, said angular position counter coupled to receive said high frequency pulses and said index signal, said index signal causing said register to reset to zero and each high frequency pulse causing said register to increment, whereby said register stores the current position of said disks;

a sector counter having a length register, said sector counter coupled to receive a sector length in terms of angular position counts from said microprocessor and incrementing said length register by said sector length in response to an increment signal;

a sector limit register coupled to receive the number of full sectors in a track multiplied by the sector length from said microprocessor and to store said number;

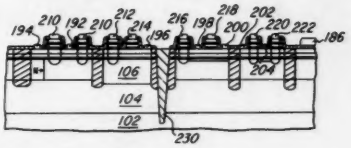
a pulse generator coupled to receive the first count of said angular position counter, the second count of said sector counter, and the number of full sectors in a track multiplied by the sector length stored in said sector limit register, said pulse generator being constructed to compare the first count of said angular position counter with the second count of said sector counter and to generate a sector pulse when said angular position count equals said sector count and said sector count is less than said sector limit.

5,068,756

INTEGRATED CIRCUIT COMPOSED OF GROUP III–V COMPOUND FIELD EFFECT AND BIPOLAR SEMICONDUCTORS

Francis J. Morris, Plano; Donald L. Plumton, Dallas; Jau-Yuann Yang, Richardson, and Han-Tzong Yuan, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 312,101, Feb. 16, 1989, abandoned. This application Jul. 18, 1990, Ser. No. 554,116
Int. Cl.[5] H01L *29/161, 29/80, 29/72, 27/02*
U.S. Cl. 357—16 **11 Claims**



1. An integrated circuit, comprising:

(a) a semiconductor layer;

(b) at least one NPN heterojunction bipolar transistor having an emitter in said semiconductor layer;

(c) at least one PNP heterojunction bipolar transistor having a base in said semiconductor layer; and

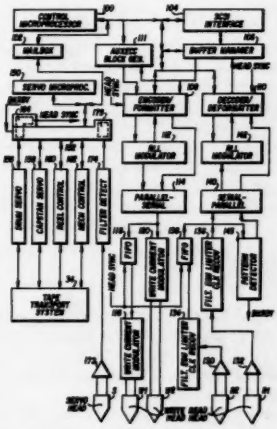
(d) electrical coupling between said transistors.

5,068,757

SERVO TRACKING FOR HELICAL SCAN RECORDER

Timothy C. Hughes, Lafayette, and Steven P. Georgis, Boulder, both of Colo., assignors to Exabyte Corporation, Boulder, Colo.

Filed Nov. 9, 1989, Ser. No. 433,977
Int. Cl.[5] G11B *5/588*
U.S. Cl. 360—77.130 **24 Claims**



1. A servo tracking method for a helical scan recorder, said helical scan recorder being of the type having a rotating drum past which magnetic tape is transported, and wherein said

rotating drum has a head mounted thereon, said method comprising:

(a) determining a reference-crossing time at which said head begins to cross a reference line drawn with respect to the beginning of a stripe recorded on said tape;

(b) sampling the amplitude of a servo signal provided on said tape at a first predetermined time after said reference-crossing time; and,

(c) using said amplitude of said servo signal at said first predetermined time to determine how to adjust the position of said head relative to the pitch of said stripe.

5,068,758

CASSETTE LOADING DEVICE FOR A TAPE RECORDER

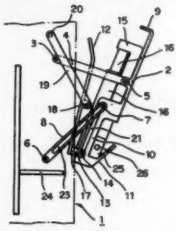
Kwang-Moon Choi, Suweon, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Kyung-Ki, Rep. of Korea

Filed Dec. 27, 1989, Ser. No. 456,858

Claims priority, application Rep. of Korea, May 23, 1989, 89-6757[U]

Int. Cl.[5] G11B *15/66*

U.S. Cl. 360—96.6 **22 Claims**



1. A cassette loading device, in which a middle portion of a door is respectively connected with each of first and second pairs of lever members supported by each of two pairs of pins on both a first and a second portion of a deck, comprising:

a door including a pair of sidewalls, an inward jaw and an outward jaw formed at a first end and a second end of the door, respectively, and a pair of guide grooves formed in a longitudinal direction of said pair of sidewalls, wherein said door is connected with each of said first and second pairs of lever members supported on the deck by each of said pairs of pins formed in first ends of each of said guide grooves;

receiving means connected with the deck via a third pair of levers for receiving a cassette, said receiving means being positioned inside of said door and having a pair of pins connected with a pair of hinge members at both of first ends of said receiving means, said pair of pins to be fitted with said guide grooves;

a pair of operating elements formed respectively at both of the first ends of said receiving means, for operating a sliding cover of the cassette; and

horizontal supporting means formed in the deck for opening a lid mounted on a first end of the cassette as said door approaches the deck.

5,068,759

THIN FILM MAGNETIC HEAD OF SMALL SIZE CAPABLE OF CERTAINLY AND STABLY CONNECTING LEAD WIRES

Mikio Matsuzaki, Koshigaya, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,041

Claims priority, application Japan, Mar. 30, 1989, 1-79457

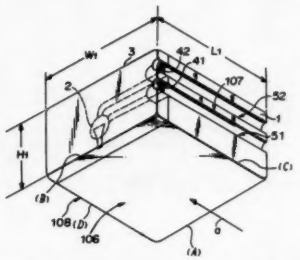
Int. Cl.[5] G11B *5/60*

U.S. Cl. 360—103 **6 Claims**

1. A thin film magnetic head comprising:

a slider having an air bearing surface, an end surface, and first and second side surfaces;

a reading/writing element formed in said end surface;



a first bonding pad for the reading/writing element formed in said first side surface;

a first groove formed in said first side surface so as to extend through said first bonding pad.

5,068,760

THIN FILM MAGNETIC HEAD FOR A BIDIRECTIONALLY MOVEABLE RECORDING MEDIUM

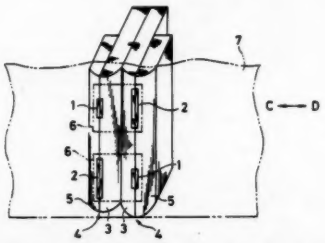
Tohru Kira, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 19, 1989, Ser. No. 368,265

Claims priority, application Japan, Jun. 23, 1988, 63-157268

Int. Cl.[5] G11B *5/28*

U.S. Cl. 360—121 **8 Claims**



1. A thin film magnetic head operable for recording and reproducing information on an elongated magnetic recording medium that is longitudinally movable bidirectionally past the magnetic head in forward and reverse directions, said magnetic head comprising:

a first head chip; and

a second head chip;

each of said first and second head chips comprising a substrate, a plurality of layers deposited in stacked relation on said substrate to form both a recording head portion and a reproducing head portion at a side edge portion of the substrate, and a protective plate covering said recording head portion and said reproducing head portion, said plural stacked layers comprising a lower magnetic layer, a first insulating layer, an electroconductive coil layer, a second insulating layer, and an upper magnetic layer, and said recording head portion of each said head chip being aligned with said reproducing head portion of said each head chip along a direction normal to said direction of longitudinal movement of the recording medium;

said first and second head chips being disposed in relatively inverted and side-by-side relation such that the recording head portion of said first head chip is located in longitudinally aligned proximity to the reproducing head portion of said second head chip for defining a first recording/repro-

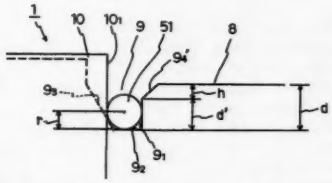
ducing head portion for use in read-after-write recording of information to the magnetic recording medium in the forward direction of longitudinal movement of the medium, and such that the recording head portion of said second head chip is located in longitudinally aligned proximity to the reproducing head portion of said first head chip for defining a second recording/reproducing head portion for use in read-after-write recording of information to the magnetic recording medium in the reverse direction of longitudinal movement of the medium.

5,068,761

DISK CARTRIDGE WITH NOTCH FOR LOCKING A SHUTTER

Yoshihisa Inoue, Saitama, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed Apr. 10, 1990, Ser. No. 507,621
Claims priority, application Japan, Apr. 25, 1989, 1-105300
Int. Cl.[5] G11B *23/03*
U.S. Cl. 360—133.0 **4 Claims**



1. A disk cartridge comprising:
a hard jacket for rotatably accommodating a disc-shaped recording medium;
a head insert hole in said jacket;
a shutter attached to said hard jacket movable generally linearly between an open position where the head insert hole is open and a closed position where it is closed;
a spring for urging the said shutter toward said closed position;
a notch at a front edge of said hard jacket;
said notch including at least a bottom wall and a side wall contiguous to said bottom wall and extending orthogonally to said front edge, which faces one side edge of said shutter when said shutter is in said open position;
said side wall of the notch is connected to said front edge of said hard jacket by a corner wall whose distance from the one side edge of the shutter standing at the open position progressively increases as it approaches said front edge of the hard jacket;
said notch being effective for accepting an engaging means for locking said shutter at said open position;
said engaging means, in its engaging position, contacting said side wall at a distance r above said bottom wall; and
said corner wall beginning at least said distance r above said bottom wall, whereby said engaging means contacts said side wall, when in its engaging position.

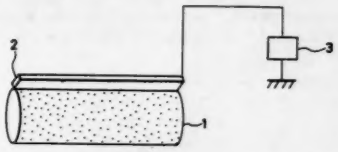
5,068,762

ELECTROPHOTOGRAPHIC CHARGING DEVICE

Toshiyuki Yoshihara, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,045
Claims priority, application Japan, Nov. 22, 1988, 63-296739
Int. Cl.[5] G03G *15/02*
U.S. Cl. 361—225 **14 Claims**

1. An electrophotographic device having an electrophotographic photosensitive member and a blade for charging arranged in contact with said photosensitive member, said photosensitive member being charged by application of a voltage on the blade for charging, wherein the ten point surface average



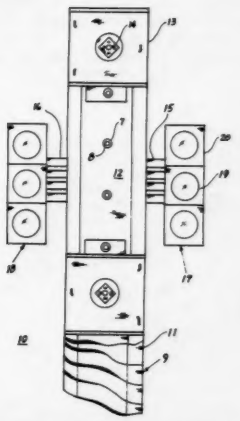
roughness Rz of said photosensitive member is 0.3 μm to 5.0 μm.

5,068,763

ELECTRIC BUSWAY-METER MODULE ARRANGEMENT

Stephen E. Brown, Selmer; Donnie F. Meeks, Savannah; Ralph W. Souders, Ramer, and Richard A. Thompson, Selmer, all of Tenn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 29, 1990, Ser. No. 605,728
Int. Cl.[5] H02G *5/06*
U.S. Cl. 361—364 **9 Claims**



1. A power busway-meter module connector comprising:
a plurality of rectangular electrical bus conductors electrically-insulated from each other and bolted together;
a corresponding plurality of electrically-conductive straps, each of said straps being welded at one of their ends to opposing edges of said bus conductors and each of said straps terminating at opposite ends, said opposite ends being adapted for connection with said straps and said electrical bus conductors; and
electrical insulation arranged over aid one ends and said straps except for said opposite ends.

5,068,764

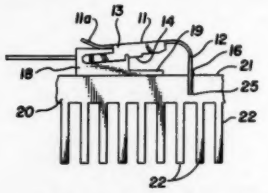
ELECTRONIC DEVICE PACKAGE MOUNTING ASSEMBLY

Donald L. Bland, Fort Worth, and Matthew C. Smithers, Lewisville, both of Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Filed Mar. 5, 1990, Ser. No. 488,117
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 **15 Claims**

10. The combination comprising:

(a) a heat sink having a substantially flat face with an opening therein;
(b) an electronic device package having a first major face and a second oppositely disposed major face; and
(c) unitary mounting means securing said electronic device package in intimate contact with said heat sink comprising



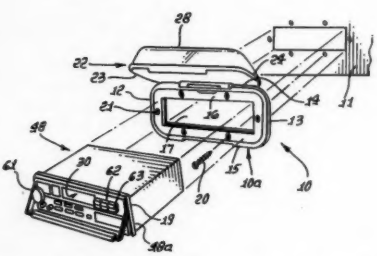
an elongated base portion having one free end and a support portion interconnected by a curved spring portion to the opposite end, said support portion secured within said opening in said heat sink and said base portion positioned against said second major face of said electronic device package and urging said first major face of said electronic device package into intimate contact with said heat sink.

5,068,765

MARINE STEREO COVER WITH DETENTING HINGE

Roy Nimpoeno, Northridge, Calif., assignor to Scosche Industries, Inc., Moorpark, Calif.

Filed Feb. 6, 1990, Ser. No. 476,338
Int. Cl.[5] H05K *7/00*
U.S. Cl. 361—422 **9 Claims**



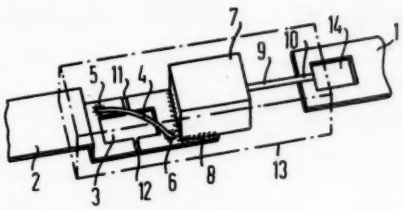
1. In a radio installation kit, for installing a radio to a marine vessel dash, the improvement comprising:
(a) a first plastic frame having first end and side walls and a main front panel interconnecting the end and side walls,
(b) forwardly facing break-away wall structure integral with the frame and associated with the main front panel, said break-away wall structure forming forward through openings to pass shaft tuning means of a first radio having a chassis, the break-away wall structure adapted to be broken away from the frame to provide a relatively large opening for alternate reception of a second chassis,
c means associated with the frame for attaching the frame to the vessel dash,
d a second frame having second end and side walls, and a transparent window carried by the second frame, the second frame sized to be registrable with the first frame,
e a hinge connection between said first and second frames, and
f detent means integral with said frames for retaining the second frame and window in a positino opened away from the first frame to allow access to said tuning means,
(g) there being a second detent connection between said frames for holding the frames in relatively closed together condition.

5,068,766

SOLID ELECTROLYTE CAPACITOR IN A CHIP STRUCTURE

Ferdinand Hilbert, Heidenheim-Schnaith, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 572,258
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1989, 3931265
Int. Cl.[5] H01G *9/00*
U.S. Cl. 361—534 **4 Claims**



1. A solid electrolyte capacitor comprising:
a capacitor body including a sintered anode member comprising a valve metal, an
oxide layer on said anode member serving as a dielectric, a cathode on said oxide layer comprising a semiconducting solid electrolyte, and a cathode contact on said cathode;
an anode terminal;
an anode wire connecting said sintered anode member to said anode terminal;
a cathode terminal connected to said cathode contact;
a fuse integrated in series in a selected terminal of said cathode and anode terminals; and
a plastic envelope covering said capacitor body and said fuse with said anode and cathode terminals extending through said envelope,
said selected terminal including an opening therein in a portion thereof within said envelope;
said fuse bridging and connected to said selected terminal on opposite sides of said opening, and
cuts through said selected terminal at said opening to separate said selected terminal and place said fuse in a series connection therewith.

5,068,767

AUTOMATIC FOCUS POSITION ADJUSTING UNIT FOR USE IN SHADOWLESS LIGHTING DEVICE

Mitsuhiro Koyama, Tokyo, Japan, assignor to Yamada Iryo Shomei Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 640,626
Claims priority, application Japan, Oct. 1, 1990, 2-102236[U]
Int. Cl.[5] A61G *13/00*
U.S. Cl. 362—33 **1 Claim**

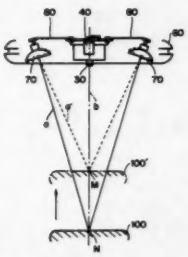
1. An automatic focus position adjusting unit for use in a shadowless lighting device for illuminating an object, said shadowless lighting device having a housing, a plurality of illuminating bulbs arranged in said housing, and a drive system for inclining said illuminating bulbs so that the optical axes of said illuminating bulbs may converge, and form a focus, on a predetermined position along a focus moving axis, said shadowless lighting device being arranged such that said focus moves in a first direction along said focus moving axis when said drive system is moved in the first direction and said focus moves in a second direction along said focus moving axis when said drive system is moved in the second direction, said automatic focus position adjusting unit comprising:
a sensor for outputting a value corresponding to the amount of light reflected form a predetermined region at the

center of a range of the light, said range being formed on said object illuminated by said illuminating bulbs;

a start switch for actuating a focus position adjustment;

a start process means for retaining, when said start switch is actuated, a value which said sensor outputs, and for performing a start process in which said drive system is driven is said first direction;

a direction adjusting means for comparing a value which said sensor outputs, after said start process means has performed the start process, with a value retained by said start process means, wherein said direction adjusting means determines that said first direction is a proper adjustment direction, when the outputted value, after said start process means has performed the start process, is higher than the value retained by said start process means, and wherein said direction adjusting means determines that said second direction is the proper adjustment direction, when the outputted value, after said start process means has performed the start process, is lower than the value retained by said start process means;



a focus moving means for driving said drive system in the proper adjustment direction, after said direction adjusting means has made its determination;

a peak detection means for monitoring a value which said sensor outputs while said focus moving means is driving said drive system, wherein when the value reaches a peak value, said peak detection means retains this peak value; and

an adjustment completion means for driving said drive system in a direction opposite to the proper adjustment direction when said peak detection means detects the peak value, and when the value which said sensor outputs again reaches said peak value, said adjustment completion means stops said drive system, thereby completing a focus adjustment.

5,068,768

VARIABLE LIGHT DISTRIBUTION TYPE AUTOMOBILE LAMP

Syoji Kobayashi, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

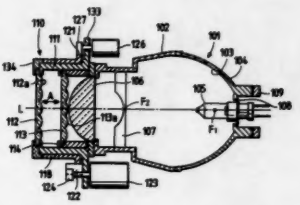
Filed Mar. 26, 1991, Ser. No. 674,996

Claims priority, application Japan, Mar. 28, 1990, 2-31135[U]; Mar. 28, 1990, 2-31136[U]

Int. Cl.[5] B60Q *1/04*

U.S. Cl. 362—61 **21 Claims**

1. A variable light distribution type automobile lamp comprising: a source of a substantially parallel flux of light; first and second lenses disposed in said flux of light, each of said first and second lenses each having formed therein a plurality of parallel cylindrical lens steps of equal pitch and a flat area, said flat areas being aligned with each other in said flux of light; and



means for varying a spacing between said first and second lenses.

5,068,769

HORIZONTAL SIGHTING APPARATUS FOR HEAD-LAMPS

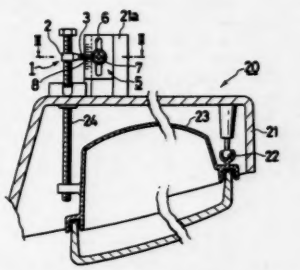
Toru Umeda, Funabashi; Hidetaka Kondo, Tokyo, and Kouichi Kato, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,939

Claims priority, application Japan, Jul. 20, 1989, 1-85275

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **6 Claims**



1. A horizontal sighting apparatus for head lamps, wherein the head lamps having a housing and an adjusting screw means for adjusting a horizontal sighting thereof, the apparatus comprising:

an index portion coupled to the adjusting screw means, and having an index which is moved by adjusting an adjusting screw of the adjusting screw means;

a mating-index portion coupled to the head lamp housing, and having a mating-index means provided at a position confronting said index portion for cooperating with said index portion; and

means for moving at least one of said index portion and said mating-index portion for coinciding them with each other irrespective of an adjustment amount of said adjusting screw means;

said index portion comprising a nut coupled to said adjusting screw and movable only in an axial direction of said adjusting screw, and said index being engaged with and cooperating with said nut; and

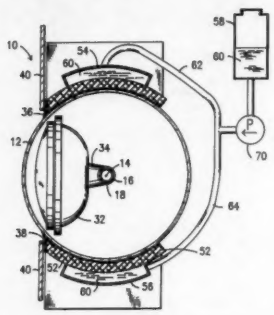
said mating-index portion comprising a mating-index mounted so as to be movable substantially in parallel with the moving direction of said nut and index, and locking means for locking said mating-index portion in a position to which it is moved.

5,068,770

SELF-CLEANING LENS SHIELD FOR HEADLIGHTS

Maurice W. Baziuk, RR16 Trowbridge Road, Thunderbay, Ontario, Canada P7B6B3

Filed Sep. 5, 1990, Ser. No. 577,998
Int. Cl.[5] B60Q *1/00*; F21V *33/00*
U.S. Cl. 362—61 8 Claims



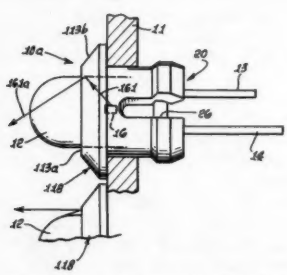
1. A device for protecting a light source, comprising:
a transparent, spherical in configuration shield member;
a hollow axle member disposed in diametrically extending relation to said shield member, said axle member having opposite ends fixedly secured to said shield member so that rotation of said axle member effects simultaneous and corresponding rotation of said shield member, and said axle member being discontinuous along its middle part;
motor means for selectively activating rotation of said axle member;
a hollow, non-rotatable tube that is received within said hollow axle member;
said light source being mounted to said non-rotatable tube;
said non-rotatable tube having opposite ends that penetrate and extend outwardly of said shield member;
said light source being conductively coupled to a source of power by electrical conductors that extend from said source of power to said light source through said hollow, non-rotatable tube;
whereby said light source is completely surrounded by said spherical shield member and protected thereby.

5,068,771

REFLECTOR LENS CAP AND/OR CLIP FOR LED

John M. Savage, Jr., 538-B Via Del La Valle, Solana Beach, Calif. 92075

Filed Apr. 29, 1991, Ser. No. 692,617
Int. Cl.[5] F21M *3/14*
U.S. Cl. 362—255 18 Claims



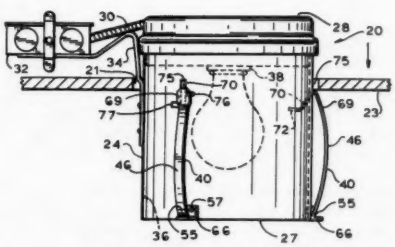
1. In a light-emitting diode assembly attachable to a display panel, said assembly comprising:
a) a light-emitting diode having locking structure thereon, said structure defining a boss,
b) a lens cap receiving the diode forwardly therein, and clip means integral with the cap and projecting sidewardly proximate the diode locking structure,
c) said clip means defining spring fingers projecting rearwardly at the side of the diode, the fingers defining first grooves to receive the boss on the diode, and second grooves to receive portions of the display panel adjacent an opening formed therein,
d) said lens cap being annular, and including a light-reflecting surface on said lens cap extending about forward extent of the diode, forwardly of said spring fingers, and oriented to reflect light rays from the diode in a generally forward direction.

5,068,772

RECESSED LIGHTING FIXTURE

James Shapiro, Placentia, and Bogdan Zakrzewski, Fontana, both of Calif., assignors to Troy Lighting, Inc., City of Industry, Calif.

Filed Aug. 30, 1990, Ser. No. 575,322
Int. Cl.[5] F21S *1/06*
U.S. Cl. 362—365 8 Claims



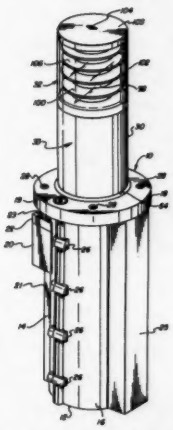
1. A recessed lighting fixture adapted for mounting in a hole having a predetermined diameter in a ceiling, and fixture comprising:
housing means having spaced apart generally vertical wall means defining an interior and having an open bottom end, said wall means having generally vertical slots therethrough;
lip means for maintaining the bottom end of said housing means against a lower surface of said ceiling;
a plurality of mounting members disposed on an exterior surface of said wall means, each of said mounting members having a first end, an outwardly curved elongated body portion made of resilient material and a second end, said first end being attached to said housing means near said bottom end, said second end extending at least partially through said slot into said interior so that at least a portion of said second end is accessible from said interior through said open bottom end, said elongated body portions having a sufficient degree of outward curvature in their unstressed condition such that the outwardmost portion of the curve extends farther than said predetermined diameter of the hole and a sufficient degree of resiliency to create an initial spring force upon insertion of said fixture into said hole, said initial spring force being of sufficient magnitude to retain said fixture in position upon said insertion, said second end further being vertically slidably retained within said slot so that, when said lighting fixture is inserted into said hold in said ceiling, sliding said second end to a lower position along said slot increases the degree of curvature of said curved elongated body portion above an upper surface of said ceiling to urge said elongated body portion against said ceiling to more securely hold said fixture; and
means for selectively locking said second end at said lower position along said slot.

5,068,773

RETRACTABLE LOW VOLTAGE LIGHTING FIXTURE

Louis Toth, Fairfield, Conn., assignor to Aqua-Lawn, Inc., Fairfield, Conn.

Filed Mar. 13, 1991, Ser. No. 668,976
Int. Cl.[5] F21V 21/22
U.S. Cl. 362—386 25 Claims



1. A low voltage lighting fixture for in-ground installation comprising:

A. an elongated exterior housing adapted to be at least partially buried in the ground, said exterior housing having an opening at one end thereof;

B. a watertight interior housing mounted for reciprocation from a retracted position within said elongated housing to a protracted position through said opening and at least partially extended from said elongated housing, said interior housing having an upper lamp portion and a lower motor portion;

C. motorized drive means in said lower motor portion for operationally engaging said exterior housing for moving said interior housing between said retracted and protracted positions;

D. a lamp carried in said upper lamp portion of said interior housing; and

E. primary electrical power means extending through said exterior housing and into said interior housing, said electrical power means being operatively connected to said lamp and said motorized drive means whereby activation of said primary electrical power means illuminates said lamp and causes said motorized drive means to move said interior housing from its retracted position to its protracted position while deactivation of said primary electrical power means deenergizes said lamp and causes said motorized drive means to move said interior housing from its protracted position to its retracted position.

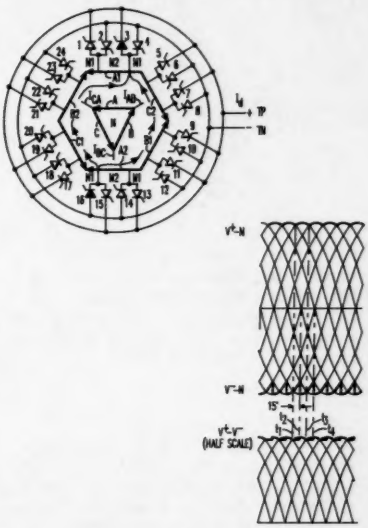
5,068,774

24-PULSE HEXAGON-TYPE AC/DC STATIC CONVERTER

John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 589,243, Sep. 28, 1990, abandoned. This application Dec. 3, 1990, Ser. No. 620,809
Int. Cl.[5] H02M 7/155, 7/162
U.S. Cl. 363—3 4 Claims

1. A static-controlled converter including a single hexagon transformer comprising: a three-phase AC current winding and six serially connected windings defining the six sides of the hexagon, each side being connected to opposite polarity DC terminals via controlled static switches, twelve pairs of said controlled static switches being symmetrically associated with the six sides of the hexagon, two of said pairs being symmetrically disposed relative to a common side of the hexagon and each pair forming a closed-loop with the opposite polarity terminals while having a common connection with the corresponding one of said windings; and means for sequentially controlling for conduction the switches of even number in said pairs in relation to one terminal and the switches of odd number in said pairs in relation to the other terminal by rotation about opposite sides of the hexagon, the sequence of said switches being synchronous with the frequency of said three-phase current, gating of a switch in a pair lagging gating of the next switch for the adjoining pair in the sequence by a predetermined firing angle, thereby create a 24-pulse output voltage and 24-pulse AC line currents with a minimum in the AC line harmonic contents.



5,068,775

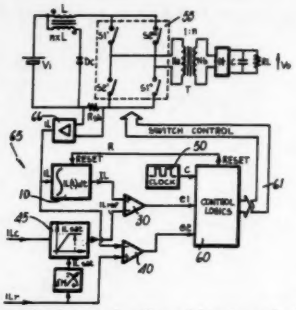
HIGH DYNAMIC PERFORMANCE DC-DC CONVERTER SYSTEM WITH TIME SHARE CONTROL

Riccardo Borgatti, Bollate, and Paolo Tenti, Padova, both of Italy, assignors to Fiar Fabbricia Italiana Apparecchiature Radioelettriche S.p.A., Milan, Italy

Filed Feb. 26, 1990, Ser. No. 485,018
Claims priority, application Italy, Mar. 3, 1989, 19656 A/89
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—15 7 Claims

1. A high dynamic performance, single stage DC/DC converter system, with time share control means, comprising DC current input means supplying said system with an input current and DC voltage output means providing a DC output voltage, at least one main circuit control loop defining one autonomous circuit system for said DC output voltage and at least one further circuit control loop defining another autonomous circuit system, for a DC output current, said further circuit control loop being internal to said main circuit control loop, said main and said further circuit control loops acting onto said two autonomous circuit systems having a first order transfer function, said time share control means simultaneously and independently controlling a peak value of said input current and said DC output voltage, said converter system further comprising rectifier mean, load impedance means and filter

inductance means arranged electrically in series with said rectifier means and said load impedance means, logic control means for simultaneously controlling an actual average current flowing through said inductance means and an instantaneous current flowing through said inductance means, said logic



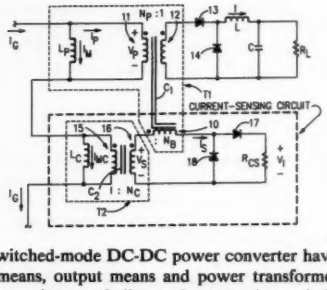
current means having a plurality of inputs and at least one output, and performing respective control operations in two separate time periods, a first one during a conduction phase of some of said rectifier means, when energy is supplied to said filter inductance means, and a second one during a turning off phase of said some of said rectifier means.

5,068,776

SWITCHED-MODE DC-DC POWER CONVERTER FOR REDUCING EFFECTS OF MAGNETIZATION CURRENT

William M. Polivka, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1990, Ser. No. 619,608
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—17 **15 Claims**



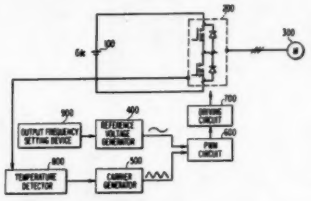
1. A switched-mode DC-DC power converter having:
input means, output means and power transformer means with a primary winding and a secondary winding connected for the separation of said input means and said output means; and
current-sensing transformer means with a primary winding and a secondary winding, and
said power converter being characterized by:
an additional winding coupled magnetically with said power transformer means for sensing a load current in said secondary winding of said power transformer, said additional winding being connected electrically with said current-sensing transformer means; and
current-sensing circuit means connected to limit the effect of the magnetization current of both said power transformer means and said current-sensing transformer means;
whereby said magnetization current is prevented from degrading said sensed load current.

5,068,777

PULSE WIDTH MODULATION TYPE INVERTER HAVING TEMPERATURE COMPENSATION

Tomotaka Ito, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,796
Claims priority, application Japan, Aug. 23, 1989, 1-216479
Int. Cl.[5] H02M *7/5395*
U.S. Cl. 363—97 **5 Claims**



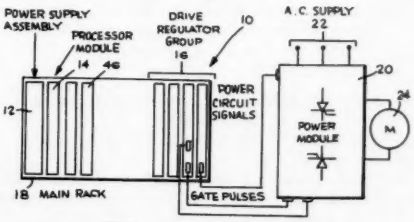
1. A pulse-width modulation-type inverter, comprising:
an inversion converter comprising a controllable element for converting a D.C. current into an A.C. current of variable output voltage and output frequency;
a reference voltage generating means operative to output a reference voltage waveform for use as a reference for said output frequency and output voltage;
carrier generating means for forming and outputting a carrier waveform at a carrier frequency;
a pulse width modulation circuit for comparing said reference voltage and said carrier and for generating a signal to control said controllable element of said inversion converter;
driving means for driving said controllable element in response to a signal from said pulse width modulation circuit; and
control means responsive to a detected operational parameter for controlling said carrier frequency within a predetermined range, said operational parameter comprising the load current of said inverter and said control means operating to increase said carrier frequency in accordance with a decrease in said load current and decrease said carrier frequency in accordance with an increase in said load current.

5,068,778

INDUSTRIAL CONTROL SYSTEM DEVICE

Marion Kosem, Willoughby Hills; Anthony J. Cachat, Hudson, and Thomas D. Toth, Lyndhurst, all of Ohio, assignors to Reliance Electric Industrial Company, Cleveland, Ohio

Filed Nov. 28, 1988, Ser. No. 276,964
Int. Cl.[5] G05B *15/00*
U.S. Cl. 364—138 **7 Claims**



1. An industrial control system device comprising a central processing unit, a system operating program contained within said central processing unit, and an application program comprising a plurality of tasks contained within said central processing unit, each of said tasks being implemented by one of a plurality of programming languages, said programming lan-

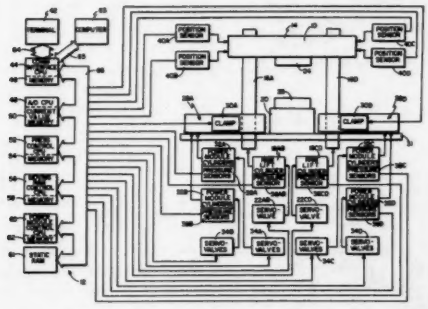
guages utilizing a symbolic name for each system variable permitting the variables to be accessible by each of said tasks, said application program being executed by said central processing unit and said operating program directing the concurrent execution of a plurality of said tasks by said central processing unit on a priority basis.

5,068,779

DEGREE OF FREEDOM DIGITAL CONTROL SYSTEM FOR A HYDRAULIC PRESS

Michael T. Sullivan, Bloomington, and Gary S. Tock, St. Louis Park, both of Minn., assignors to MTS Systems Corporation, Minneapolis, Minn.

Filed Mar. 28, 1989, Ser. No. 329,572
Int. Cl.[5] G06F *15/46;* B29C *3/06*
U.S. Cl. 364—167.01 **27 Claims**



13. A degree of freedom (DOF) control system for control of the movement of a body in a plurality of degrees of freedom, the control system comprising:

motion actuators responsive to actuator commands for applying force to the body at a plurality of mutually spaced locations;

feedback means for providing feedback information relating to changes in position of selected points on the body; and

signal processing means for generating the actuation commands, the signal processing means including:

memory for storage of contemporaneous servoloop output commands, feedback information and DOF feedback sums;

feedback summing means responsive to the feedback information accessed from memory for generating DOF feedback sums and storing DOF feedback sums to memory;

command means operating on a motion control procedure for generating servoloop input commands;

DOF servoloop means for generating the servoloop output commands as a selectable function of the DOF feedback sums and the servoloop input commands; and

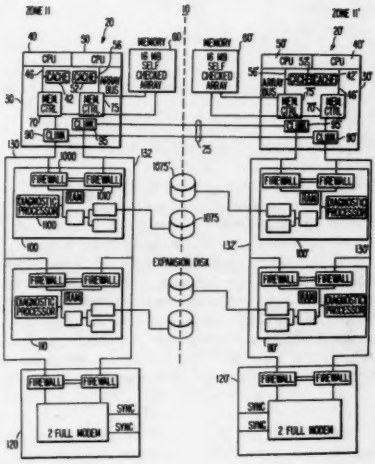
DOF summing means responsive to the servoloop output commands for generating actuator commands.

5,068,780

METHOD AND APPARATUS FOR CONTROLLING INITIATION OF BOOTSTRAP LOADING OF AN OPERATING SYSTEM IN A COMPUTER SYSTEM HAVING FIRST AND SECOND DISCRETE COMPUTING ZONES

William Bruckert, Northboro; David Kovalcin, Grafton, both of Mass.; Thomas D. Bissett, Derry, N.H.; John Munzer, Brookline, Mass.; Dennis Mazur; Peter R. Mott, Jr., both of Worcester, Mass.; Glenn A. Dearth, Hudson, Mass.; Carlos Alonso, Marlboro, Mass., and Ann Katan, Newton Highlands, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 1, 1989, Ser. No. 388,090
Int. Cl.[5] G06F *9/445, 9/24*
U.S. Cl. 395—700 **12 Claims**



1. In a computer system having first and second discrete computing zones, a method for initiating bootstrap loading of an operating system, the first zone including a first CPU and the second zone including a second CPU, said first and second CPUs for independently executing said method for initiating bootstrap loading, each of said zones having a status register accessible by the other zone, said method comprising the steps of:

determining either that a selected one of the first and second zones is allowed to bootstrap load or that a non-selected one of said first and second zones is incapable of running the operating system;

determining whether the non-selected zone has initiated bootstrap loading of the operating system by accessing, from the selected zone, the status register in the non-selected zone; and

initiating bootstrap loading in the selected zone at times when said selected zone is allowed to bootstrap load;

initiating bootstrap loading in the selected zone at times when said non-selected zone is incapable of running the operating system; and

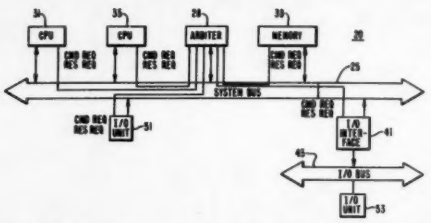
initiating bootstrap loading in the selected zone at times when said non-selected zone has not initiated bootstrap loading of the operating system;

wherein the step of determining whether the selected zone is allowed to bootstrap load includes the substep of determining that bootstrap loading of the selected zone cannot be initiated at times when the non-selected zone has initiated bootstrap loading.

5,068,781
METHOD AND APPARATUS FOR MANAGING MULTIPLE LOCK INDICATORS IN A MULTIPROCESSOR COMPUTER SYSTEM

Richard B. Gillett, Jr., Westford, and Douglas D. Williams, Pepperell, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 44,954, May 1, 1987, Pat. No. 4,858,116. This application Jun. 28, 1989, Ser. No. 372,565
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[5] G06F *13/38, 13/42*
U.S. Cl. 395—325 **14 Claims**



1. A system for implementing exclusive read-modify-write operations, said operations having a set of distinct transactions including an interlock read transaction to retrieve information stored at a specified location and restrict access to said stored information by subsequent interlock read transactions, and an unlock write transaction to store information in said specified location and restore access to said stored information, said interlock read transaction including a command transfer comprising an interlock read command arbitration, an interlock read command message including an interlock read command, and an interlock read command confirmation; said interlock read transaction further including a response transfer, said response transfer comprising a response arbitration, a response message, and a response confirmation; said unlock write transaction including a command transfer comprising an unlock write command arbitration, an unlock write command message, and an unlock write command confirmation; said system comprising:

a synchronous pended bus;

a plurality of first nodes coupled to said synchronous pended bus, each functioning as a commander node to initiate said interlock read and unlock write command messages, at least one of said first nodes comprising means for receiving, at a predetermined time subsequent to initiation of said interlock read command message by said one first node during bus cycles reserved by said interlock read command arbitration, said interlock read command confirmation indicating receipt of said interlock read command message initiated by said one first node and for receiving, at an unspecified time subsequent to initiation of said interlock read command message during bus cycles reserved by said response arbitration, a lock response message indicating whether said interlock read command was executed; and

a second node coupled to said synchronous pended bus, functioning as a responder node, said second node comprising: means for receiving said interlock read command message from said one first node;

storage means, including said specified location, for storing information;

lock means, associated with said storage means and operable between an unlocked condition and a locked condition, for permitting access to said storage means when in an unlocked condition and for denying access to said storage means when in a locked condition;

acknowledge means for acknowledging receipt of said interlock read command message by transmitting to said one first node, at a predetermined time subsequent to transmission of said interlock read command message during bus cycles reserved by said interlock read command arbitration, said interlock read command confirmation indicating successful receipt of said interlock read command message;

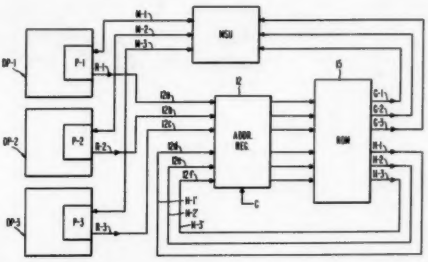
command means responsive to an interlock read command message from said one of said first nodes for generating a lock status indication indicating the condition of said lock means and for switching said lock means from an unlocked condition to a locked condition, and responsive to an unlock write command message for storing modified information in said specified location and for switching said lock means from the locked condition to the unlocked condition; and

status response means for transmitting to said one first node, at an unspecified time subsequent to initiation of said interlock read command message during bus cycles reserved by said response arbitration, said lock response message including said lock status indication.

5,068,782
ACCESSING CONTROL WITH PREDETERMINED PRIORITY BASED ON A FEEDBACK ARRANGEMENT

James H. Scheuneman, St. Paul, and Lawrence R. Fontaine, Minneapolis, both of Minn., assignors to Unisys Corp., Detroit, Mich.

Continuation of Ser. No. 9,985, Feb. 2, 1987, abandoned. This application Oct. 5, 1989, Ser. No. 418,911
Int. Cl.[5] G06F *13/18, 12/02*
U.S. Cl. 395—425 **18 Claims**



1. Accessing control means for use in selecting the manner in which a plurality of requestors are to be granted access to a commonly shared means, said accessing control means comprising;

means providing respective request signals for said requestors, each request signal indicating whether access is currently being requested by its respective requestor;

an addressable programmed memory for producing a memory output dependent upon an applied address and the programming of said memory, said memory output comprising first and second memory output portions, said first memory output portion being indicative of a future access granting selection for said requestors and said second memory output portion being indicative of the recency of previous granting selections provided for said requestors;

means responsive to said first memory output portion for granting access to the requestor indicated thereby; and

addressing means for sequentially applying addresses to said memory, each address being comprised of first and second address portions, said first address portion being derived from said request signals so as to be indicative of which one or more of said requestors is requesing access and said second address portion being indicative of previous granting selections provided for said requestors, said second address portion being derived by feeding ack to said addressing means a previously produced second memory output portion;

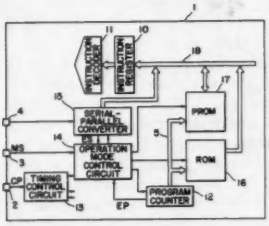
and means responsive to said first memory output portion for granting access to the requestor indicated thereby.

5,068,783

MICROCOMPUTER HAVING A BUILT-IN PROM FOR STORING AN OPTIONAL PROGRAM

Kouji Tanagawa, and Tomoaki Yoshida, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,804
Claims priority, application Japan, Oct. 24, 1985, 60-238268
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—575 **16 Claims**



1. A single-chip microcomputer having a mode selection terminal for receiving a mode selection signal, the mode selection signal having a first state when the microcomputer is to be operable in an application mode and having a second state when the microcomputer is to be operable in a test mode, the microcomputer further having a data terminal to receive serial bits forming instructions for a test program, said microcomputer comprising:

logic circuits;

a read-only memory for storing an application program, said read-only memory having a plurality of memory locations each identified by an address;

a programmable read-only memory for storing the test program for testing said logic circuits to verify operability thereof, said programmable read-only memory having a plurality of memory locations each identified by an address;

a data bus coupled to each of said read-only and programmable read-only memories;

program counter means coupled to each of said read-only and programmable read-only memories for designating addresses corresponding to memory locations therein storing application and test programs to be fetched;

means for converting the serial bits forming the instructions for the test program from the data terminal into sets of parallel bits, each of the sets of parallel bits being outputted to said programmable read-only memory when the mode selection signal is in the second state;

mode control means for enabling execution of the application program stored in the memory locations of said read-only memory when the mode selection signal is in the first state, said mode control means sequentially producing first and second signals when the mode selection signal is in the second state;

said programmable read-only memory in response to said first signal storing one of the sets of parallel bits from said converting means;

said program counter means in response to said second signal incrementing the value of the address thereof;

said mode control means successively generating an execution signal after the address designated by said program counter means reaches a predetermined value; and

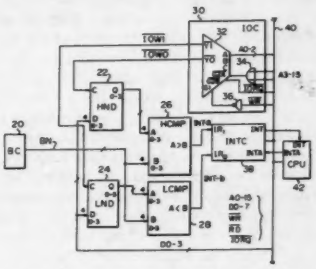
means, in response to said execution signal, for executing the test program stored in memory locations of said programmable read-only memory so that the sets of parallel bits are read out onto the data bus whereby the operability of said logic circuits can be verified.

5,068,784

METHOD AND SYSTEM FOR MONITORING THE NUMBER OF AVAILABLE BUFFERS

Kuniaki Kishino, and Tamiya Nakamura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1989, Ser. No. 382,316
Claims priority, application Japan, Jul. 28, 1988, 186791
Int. Cl.[5] G06F *7/00, 7/02*
U.S. Cl. 395—275 **13 Claims**



9. In a system for monitoring buffers coupled to a central processing unit having at least one interrupt input port, the system comprising:

(a) means for storing a predetermined limit value on a range of numbers of available buffers and outputting a first signal representing a magnitude of the limit value;

(b) means for monitoring availability of the buffers and outputting a second signal indicative of a number of the buffers which are available;

(c) means, coupled to said monitoring means and said storing means, for comparing the first signal with the second signal to produce a third signal indicative of whether the number of available buffers is beyond the limit value relative to the range;

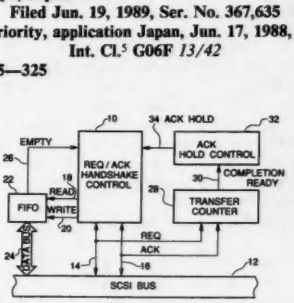
(d) means, coupled to said comparing means, for producing an interrupt signal when the third signal is indicative that the number of available buffers is beyond the limit value relative to the range, and providing the interrupt signal to said interrupt port of the central processing unit.

5,068,785

BUS CONTROL FOR SMALL COMPUTER SYSTEM INTERFACE WITH TRANSFER INDICATION PRECEDING FINAL WORD TRANSFER AND BUFFER EMPTY INDICATION PRECEDING RECEIPT ACKNOWLEDGEMENT

Yukinori Sugiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 367,635
Claims priority, application Japan, Jun. 17, 1988, 63-149703
Int. Cl.[5] G06F *13/42*
U.S. Cl. 395—325 **9 Claims**



1. A bus control system including a handshake control circuit connected to receive an information transfer request signal from a data bus and to generate an information receipt acknowledge signal, the handshake control circuit operating to

control a handshake between the information transfer request signal and the information receipt acknowledge signal, a first in-first out type memory coupled to the data bus and controlled by the handshake control circuit so as to receive information from the data bus and to output information to the data bus, the memory outputting an empty signal when the memory is empty, the empty signal being supplied to the handshake control circuit, a counter configured to be preset with an information transfer number and coupled to receive the information receipt acknowledge signal generated by the handshake control circuit so as to count the number of the information transfers executed and to generate a transfer completion ready signal when the information transfers of the number less than the preset number of the information transfers by one have been executed, and an information receipt acknowledge hold control circuit coupled to receive the transfer completion ready signal, the information receipt acknowledge hold control circuit operating to control the handshake control circuit, after the transfer completion ready signal is activated, so as to cause the handshake control circuit to hold the information receipt acknowledge signal in an active condition after the information receipt acknowledge signal in correspondence to a last information transfer is activated and until the empty signal is activated to indicate the emptiness of the memory.

5,068,786

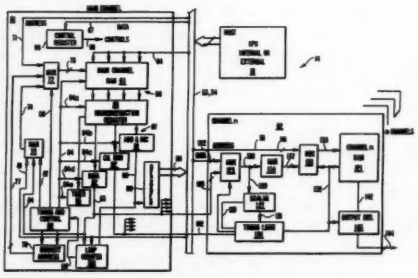
METHOD FOR CONTROLLING RADIO FREQUENCY EXCITATION AND GRADIENT PULSE CHARACTERISTICS IN A MAGNETIC RESONANCE IMAGING SYSTEM

Zvi Netter, Haifa, and Menachem Bar-Lev, Herzelia, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Division of Ser. No. 183,299, Apr. 11, 1988, Pat. No. 4,845,613, which is a continuation of Ser. No. 669,369, Nov. 8, 1984, abandoned. This application Mar. 23, 1989, Ser. No. 327,696

Int. Cl.[5] G06F *11/28, 7/182*

U.S. Cl. 395—800 **6 Claims**



1. A method for controlling radial frequency pulse excitation and gradient pulses applied during a scan cycle in a magnetic resonance imaging (MRI) system, said system including a magnet (magnets), excitation and detection units, a controller comprising a main channel and a plurality of output channels, said MRI system operated responsive to operating data including: instructions, timing information and RF pulse pattern data provided by a central processing unit (CPU), said method comprising the steps of:

transmitting said operating data from the CPU to the controller;

storing said operating data received from said CPU in said main channel and said output channels,

controlling the scan cycle with the controller using said operating data received from said CPU;

commencing the scan cycle when said instructions and timing information included in the operating data are received from the CPU by said main channel and when the RF pulse data is received by at least some of said plurality of output channel;

said controlling step, including the steps of:

transmitting instructions and timing information for controlling the output of the received RF pulse pattern data from the at least some of said output channels responsive to the instructions and timing information stored in said main channel after receipt from said CPU; and

controlling said excitation units of the MRI system with said RF pulse pattern data;

wherein the step of transmitting data from said CPU to said main channel and to said output channels further includes the steps of:

transferring scan sequence cycle control from said CPU to said main channel after receipt by said controller of said operating data from the CPU; energizing the excitation units of the MRI system responsive to said operating data to perform a scan sequence cycle while control of the scan sequence cycle is in said main channel after transfer of control from said CPU to said main channel;

returning scan sequence cycle control to said CPU from said main channel at the end of said scan sequence cycle whereby the scan sequence cycle is accomplished under control of said controller instead of said CPU, and

defining said scan sequence cycle using the timing information transferred from said CPU to said main channel;

and further including the step of transferring said instructions and timing information from said main channel to said output channels, said last named transferring step including:

selecting the at least some of said output channels,

providing said instructions to a data field in said main channel, and timing information to a timing field in said main channel for selecting starting addresses in said selected output channels to output pattern data,

providing said instructions to a data run field in said main channel for selecting either a "run" or a "standby" condition for said selected output channels, and

providing an address and control field in said main channel for instructions for activating the selected output channels to control desired ones of said MRI system units.

5,068,787

MEANS AND METHODS OF TABULATING TIME AND TASK PERFORMANCES

Lawrence S. Pipella, Scottsdale; Logan M. Fanjoy, Mesa; Rodger L. Lawless, and James E. Davies, both of Chandler, all of Ariz., assignors to Analysist Development Group, Inc., Scottsdale, Ariz.

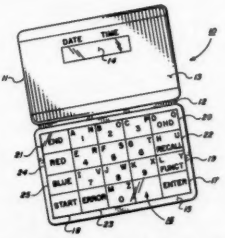
Filed Mar. 13, 1990, Ser. No. 492,544

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—406 **7 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 195 Pages)



1. A system for recording in real-time units-of-work, said units-of-work representing the increment of time an employee spends at a job related function and a job related device or overhead activity, said time being associated with a unique

operator identification and department-identification, and making a permanent record thereof, comprising:

a portable data collection card, said card including keyboard means having a plurality of field key means and numerical key means; said field key means including a "START" key means to indicate the start of the unit-of-work collection process, "OHD" key means to indicate non-specific work, and "END" key means to indicate the end of the unit-of-work collection process, a first and second toggle key means to activate respective first and second keyboard mappings; control means, activatable by said "START", "OHD" and "END" key means, to start the collection of units-of-work, to suspend the collection of units-of-work, and to end the collection of units-of-work, respectively; memory means for storing said collected units-of-work; display means for displaying time data and instructional prompts; a first power source for transmitting data to a collection station; a second power source for energizing said control means; a bi-directional optical interface for downloading real-time units-of-work to said collection station;

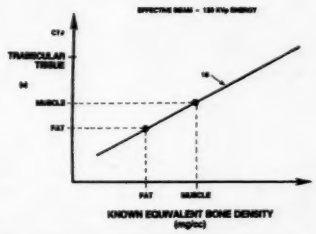
said collection station having keyboard means having a plurality of collector field key means and numerical key means; collection station control means for controlling the operation of the collection station; said collector field key means including a "STATUS" key means for actuating the collection station control means to determine the identity and magnitude of information currently residing in said collection station; memory means for storing data; display means for displaying data; a power source for energizing the collection station control means; bi-directional optical interface means for receiving data from the portable data collection card; and means for communicating said receiving data from said collection station interface to a main computer.

5,068,788

QUANTITATIVE COMPUTED TOMOGRAPHY SYSTEM

David J. Goodenough, Myersville, and Charles Stockham, Columbia, both of Md., assignors to Columbia Scientific Inc., Columbia, Md.

Filed Nov. 29, 1988, Ser. No. 277,269
Int. Cl.[5] G06G *7/60*
U.S. Cl. 364—413.14 **20 Claims**



1. A method for non-invasively determining the density of a selected tissue without using an external reference, comprising the steps of:

selecting a tissue;

selecting a scan region which includes said tissue;

entering spatial parameters of the three-dimensional scan region into a computer;

performing a computed tomography scan of said scan region;

quantitatively determining the effects of said selected tissue on data obtained by performing said computed tomography scan, said step of quantitatively determining effects comprising the steps of:

calculating a histogram of computed tomography numbers obtained from said computed tomography scan of said scan region which includes said tissue;

identifying a peak within said histogram by locating its leading edge;

determining whether a first moment of said peak is within predetermined limits;

adjusting the peak to obtain an adjusted peak by varying said first moment to fit within said predetermined limits; and

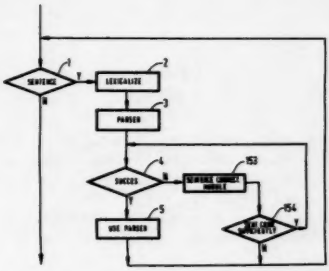
calculating a second moment of the peak, said second moment being indicative of the computed tomography number of said selected tissue.

5,068,789

METHOD AND MEANS FOR GRAMMATICALLY PROCESSING A NATURAL LANGUAGE SENTENCE

Eduardus J. W. van Vliembergen, Venlo, Netherlands, assignor to OCE-Nederland B.V., Netherlands

Filed Sep. 15, 1989, Ser. No. 407,564
Claims priority, application Netherlands, Sep. 15, 1988, 8802271; Apr. 26, 1989, 8901050
Int. Cl.[5] G06F *15/38, 1/00*
U.S. Cl. 364—419 **18 Claims**



1. A computer method for grammatically processing a natural language sentence made up of word units using processing means comprising the steps of:

a. Lexicalizing each of said word units in accordance with verbal categories and application directed categories registered in a lexical memory, for storing the lexicalized word units in a word memory;

b. Parsing said lexicalized word units read out from said word memory to provide at least one sentence representation for storing in a sentence representation memory for storing in a sentence representation memory, and including the steps of generating at least one constituent structure having functional indications from said word units, each of said sentence representations having associated therewith a probability factor and

a) determining successively for each word unit supplied by the word memory and for each constituent supplied by the sentence representation memory and allocated with a constituted category the functional word category belonging to that word unit within the structure of said constituent by reference to grammar data list in a grammar data memory and concerning said verbal category of said word unit and the category of said constituent for updating or supplementing the respective sentence representations,

b) describing for each constituent supplied by sentence representation memory and allocated with a category of a parent constituent, said parent constituent dominating said constituent, a closure process for said constituent based upon grammar data entered in the grammar data memory and concerning the category of said constituent and said parent constituent and (ii) allocating a functional label that can be provisional to said constituent to be closed by said closure process; and

c) testing the interrelation between the words and constitu-

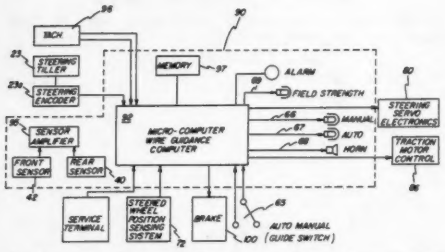
ents of said parent constituent as to functional categories of said words and said constituents during at least step b) (i) or b) (ii) against rules stored in said grammar data memory and based upon syntax and changing said probability factor if an error is detected and selecting each sentence representation having a probability factor above a preselected threshold value.

5,068,790

WIRE GUIDANCE CONTROL SYSTEM

Tim A. Wellman, Coldwater, Ohio, assignor to Crown Equipment Corporation, New Bremen, Ohio

Filed Dec. 6, 1989, Ser. No. 446,847
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—424.02 **4 Claims**



3. Apparatus for controlling an operation of an operator controlled materials handling vehicle that includes wire guidance for guiding the vehicle in response to a signal carried by a guide wire including

wire guidance control means for supplying information regarding an angle of approach of the vehicle to a buried wire,

means for selecting either a manual mode of vehicle operation or a wire guidance mode of vehicle operation,

means for comparing the speed and the angle of approach of the vehicle to predetermined limits and for generating an out-of-limit condition if either one of said predetermined limits is exceeded,

means for applying the vehicle's brakes to stop the vehicle and to disable the vehicle from further travel in response to said comparing means detecting said out-of-limit condition when the vehicle is in the wire guidance mode of operation and the guide wire signal is being detected.

5,068,791

DISTANCE AND ANGLE MEASUREMENTS IN A WIRE GUIDED VEHICLE

Kim A. Klopfleisch, St. Marys; Tim A. Wellman, Coldwater; Willard D. Kaiser, Grove City; Mark J. Koenig, Worthington; Richard W. Ridgway, Westerville; Bobby L. Walters, Columbus, and Matthew S. Zelinski, Worthington, all of Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio

Filed Dec. 6, 1989, Ser. No. 446,896
Int. Cl.[5] G05D *1/03*
U.S. Cl. 364—424.02 **9 Claims**

1. A method for determining the distance of a guided vehicle from a wire carrying an alternating current signal, said method comprising the steps of

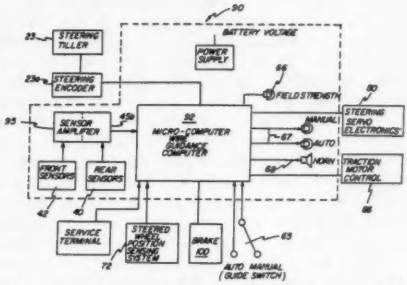
providing the vehicle with a set of sensor coils for detecting the signal carried by the wire where the space between the sensor coils is divided into regions,

normalizing the output from each coil,

converting the normalized output from each coil into a distance value by reference to a look up table,

determining which coil has the highest normalized output,

determining which region the wire is in by determining which adjacent coil has a normalized output greater than a predetermined minimum value,



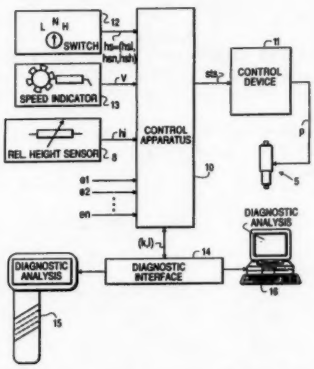
combining the distance measurements from the selected coils defining the region to derive a sensor bar-to-wire distance measurement.

5,068,792

METHOD AND AN ARRANGEMENT FOR ADJUSTING A HEIGHT CONTROL SYSTEM OF A VEHICLE

Hans-Thomas Lehr, Weissach, and Peter Schäfer, Mönsheim, both of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 11, 1990, Ser. No. 535,530
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919040
Int. Cl.[5] B60G *17/00*; G01C *5/00*
U.S. Cl. 364—424.05 **7 Claims**



5. A height control system for a vehicle having a chassis and a body comprising: at least one height adjusting means for raising or lowering said body relative to a first reference point, height sensing means for measuring the height of said body relative to a second reference point, control means for causing said height adjusting means to raise or lower said body; said control means including means for presetting a desired height for said body, for detecting differences between said desired height and the height measured by said height sensing means and for causing said control means to raise or lower said body in response thereto, diagnostic interface means for communicating error signals from said height control system, diagnostic means for adjusting said height control system in response to signals communicated from said height control system and in response to manually inputted commands, said diagnostic means being operatively connected to said diagnostic interface means and having input means for receiving manually inputted commands, and further having means responsive to said manu-

ally inputted commands for causing said control means to initiate a level-adjusting function, an incremental-controlling-of-the-adjusting-means function and a set function.

5,068,793

APPARATUS FOR TRIGGERING PASSENGER PROTECTION SYSTEMS

Claus Condne, Wadgassen; Bernhard Mattes, Sachsenheim, and Dieter Schmalz, Pleidelsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

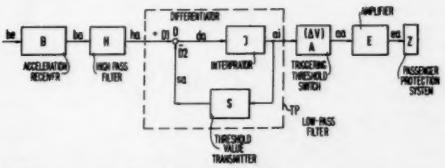
PCT No. PCT/DE87/00078, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/00146, PCT Pub. Date Jan. 14, 1988

PCT Filed Feb. 28, 1987, Ser. No. 276,319

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621580

Int. Cl.[5] B60R *21/32*

U.S. Cl. 364—424.05 **7 Claims**



1. An apparatus for triggering passenger protection system, in particular restraining system of motor vehicle upon impact, said apparatus comprising an acceleration receiver for outputting an acceleration signal in response to a vehicle acceleration; differential means having a first input for receiving the acceleration signal, a second input for receiving an integration threshold value signal, and an output for outputting a differential signal; an integrator having an input for receiving the differential signal and an output for outputting a control signal upon receiving the differential signal; a threshold value transmitter for communicating a variable integration threshold value signal to said second input of said differentiation means in response to the control signal; the control signal causing triggering of said protection system when the control signal exceeds a predetermined triggering value.

5,068,794

SYSTEM AND METHOD FOR COMPUTING ASYNCHRONOUS INTERRUPTED FUEL INJECTION QUANTITY FOR AUTOMOBILE ENGINES

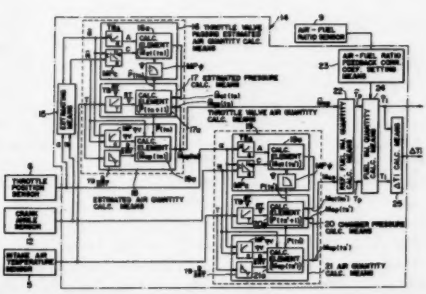
Hiroshi Hosaka, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,841

Claims priority, application Japan, Apr. 28, 1989, 1-110566

Int. Cl.[5] F02M *51/00*

U.S. Cl. 364—431.05 **14 Claims**



1. A system for controlling fuel injection of an engine having a plurality of cylinders, an intake passage for inducing air and fuel mixture into at least one of said cylinders, a throttle valve provided in said intake passage for controlling an amount of air, and a fuel injector provided in said intake passage for injecting fuel, comprising:

engine speed sensing means for detecting a first engine speed at a first reference crank angle before an intake stroke cycle of the engine and a second engine speed at a second reference crank angle in said intake stroke cycle;

throttle position sensing means for sensing a first throttle opening degree at said first reference crank angle and a second throttle opening degree at said second reference crank angle;

estimating means for estimating what an estimated throttle opening degree and an estimated engine speed will be for said engine after a predetermined time period in said intake stroke cycle has lapsed, based on said first throttle opening degree and said first engine speed, respectively;

first air quantity calculating means responsive to said estimated throttle opening degree and said estimated engine speed for calculating a first air quantity which will be induced in said cylinder during said intake stroke cycle;

second air quantity calculating means responsive to said second engine speed and said second throttle opening degree for calculating a second air quantity induced in said cylinder during said intake stroke cycle;

fuel injection quantity calculating means for calculating a first fuel injection quantity in accordance with said first air quantity, which first fuel injection quantity is injected from the point of said first crank reference angle, and for calculating a second fuel injection quantity in accordance with said second air quantity; and

synchronous interrupted fuel injection quantity calculating means for calculating an synchronous interrupted fuel injection quantity in accordance with a difference value between said first and second fuel injection quantity, which synchronous interrupted fuel injection quantity is injected from the point of said second crank reference angle.

5,068,795

SYSTEM FOR DETECTING POSITION OF MOVING VEHICLE

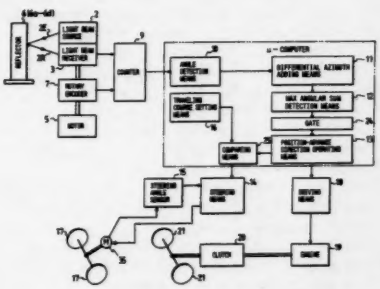
Kenji Kamimura, and Sadachika Tsuzuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,934

Claims priority, application Japan, Oct. 18, 1988, 63-262191

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **4 Claims**



1. In a system for detecting a position of a moving vehicle wherein light signals radiated from light emitting means provided at at least four reference points apart from the moving vehicle are received, and the position and an advance direction of the moving vehicle are detected on the basis of received

signals of the light emitted from three particular reference points of the at least four reference points, said system comprising:

light-receiving means mounted on the moving vehicle and rotating in a horizontal plane for receiving the light signals,

means for detecting azimuths of the reference points in respect of the advance direction of the moving vehicle on the basis of the light signals at the light-receiving means,

means for determining the differential azimuths between the adjoining two reference points of all said four reference points viewed from the moving vehicle,

means for calculating the sum for each pair of said differential azimuths adjoining each other,

means for selecting a combination of a particular two of said adjoining differential azimuths with which the calculated sum of said two selected adjoining differential azimuths becomes largest among the sums of said other pairs, and

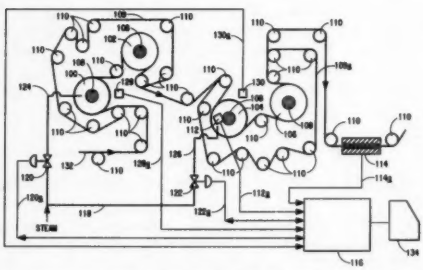
means for determining the position and the advance direction of the moving vehicle on the basis of the selected two differential azimuths and the coordinate values of the three reference points forming the selected two differential azimuths.

5,068,796

CONTROL OF SHEET OPACITY

Hanh P. Hellenguard, Richmond; Lawrence J. Koth, Midlothian, and Donald T. Vaughan, Richmond, all of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1989, Ser. No. 449,408
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—469 **4 Claims**



1. A computer-aided method for on-line control of opacity of a moving non-woven sheet of film-fibril strand material wherein the opacity is a function of a thermal bonding finishing process applied to each side of the sheet bypassing one side of the sheet around and in contact with a first rotatable driven drum heated to a first bonding temperature by steam supplied under pressure from a first variable position steam valve, then passing the other side of the sheet around and in contact with a second rotatably driven drum heated to a second bonding temperature by steam supplied under pressure from a second variable position steam valve, the method comprising:

providing the computer with an aim opacity level;

providing the computer with a data base including the following parameters by sensing at sensor locations;

first drum temperature

first drum steam pressure

second drum temperature

second drum pressure

speed of the sheet

opacity measurements at n locations across the width of the sheet after passing the second drum;

repetitively determining the values of said parameters as the sheet passes around the first and second drums;

repetitively providing the computer with the values of said parameters;

comparing opacity aim with the average opacity of n locations across the sheet to produce an opacity error signal; and

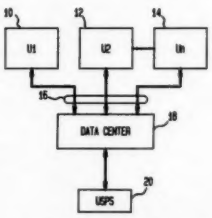
adjusting first and second steam drum pressures which determine the degree of thermal bonding which in turn affects opacity of said moving nonwoven sheet to minimize the opacity error signal.

5,068,797

OPTIMIZING MAIL DELIVERY SYSTEMS BY ROUTING

Ronald P. Sansone, Weston, and Karl H. Schumacher, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 3, 1989, Ser. No. 416,745
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—478 **26 Claims**



1. A system for handling mail for delivery between first and second stations, wherein a plurality of delivery routes exist between said first and second stations, and wherein carriers of determinable capacity are available for transporting mail via said routes, said system including a data processing station, a user station for assembling batch mail to be transported to said first station and thence to said second station, and communication paths interconnecting said data processing station with said user station and said first station, the improvement wherein:

said user station comprises means for transmitting to said data processing station data concerning quantities of mail to be transported therefrom to said first station and thence to said second station,

said data processing station comprises a source of data concerning available capacity of said carriers via each of said routes, and

said data processing station comprises means responsive to said data received from said user station for transmitting to said first station data identifying a carrier that has adequate mail carrying capacity to transport mail of said user station along at least a portion of its respective route.

5,068,798

PROCESS ENVIRONMENT MONITORING SYSTEM

Warren J. Heath, Marlboro; Rene J. Langner, Plainville, and Charles A. Bell, Weston, all of Mass., assignors to Precision Systems, Inc., Natick, Mass.

Filed Mar. 3, 1989, Ser. No. 319,139
Int. Cl.[5] G01N *31/00*
U.S. Cl. 364—497 **3 Claims**

1. In a process environment monitoring system, a method of testing gas from a process environment comprising:

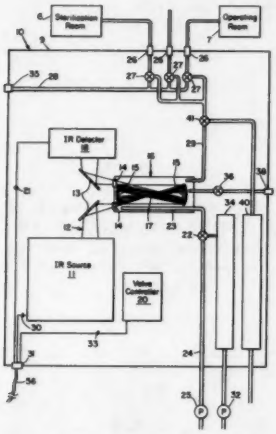
drawing a sample of gas from the process environment into a test cell;

identifying gas in the test cell with a gas analyzer;

evacuating a volume which is larger in size than the test cell;

after identifying said gas, opening fluid communication between the test cell and the evacuated volume such that

said gas is rapidly drawn from the test cell to the evacuated volume to clear the test cell; and



drawing purge gas through the test cell to substantially replace gas in the cell with purge gas.

5,068,799

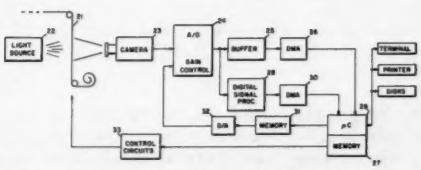
SYSTEM AND METHOD FOR DETECTING FLAWS IN CONTINUOUS WEB MATERIALS

Harold M. Jarrett, Jr., 450 Barkshire La., Roswell, Ga. 30075

Filed Apr. 24, 1985, Ser. No. 726,529

Int. Cl.[5] G01N *21/88*

U.S. Cl. 364—507 **15 Claims**



1. A method of detecting flaws in continuous web material which is illuminated and which is scanned by an optical scanning system to produce digitized output signals representative of said material, said method comprising the steps of:

processing said digitized output signals utilizing digital matched filters corresponding to flaw patterns known to be present in said material to identify signals present therein which are representative of flaws in said material; and

generating first output signals indicative of the locations of said flaws in said material.

5,068,800

CRACK DETECTION METHOD FOR SHAFT AT REST

Warren R. Brook, Medford, N.J., and William H. Miller, Loudonville, N.Y., assignors to REM Technologies, Inc., Albany, N.Y.

Continuation-in-part of Ser. No. 323,313, Mar. 14, 1989, Pat. No. 4,975,855. This application Sep. 19, 1990, Ser. No. 584,893

The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.

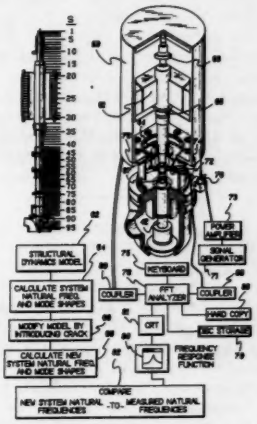
Int. Cl.[5] G01N *27/82*; G01R *33/12*

U.S. Cl. 364—507 **46 Claims**

28. A method for detecting a crack in a shaft system under test, comprising the steps of:

employing a multi-station analytical model of the shaft system to determine a natural frequency of interest for a crack at a designated location and to predict a shift of said natural frequency of interest as a function of crack depth;

measuring an actual natural frequency of the shaft system under test at rest in response to a vibration inducing force excitation, said actual natural frequency being in the region of the natural frequency of interest; and



comparing said actual natural frequency to the predicted shift of the natural frequency of interest to determine a correlation therebetween, whereby such a correlation indicates the existence of a crack in the shaft system and the severity thereof.

5,068,801

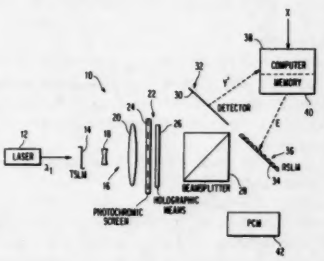
OPTICAL INTERCONNECTOR AND HIGHLY INTERCONNECTED, LEARNING NEURAL NETWORK INCORPORATING OPTICAL INTERCONNECTOR THEREIN

Rodney L. Clark, and Charles F. Hester, both of Huntsville, Ala., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 6, 1989, Ser. No. 431,899

Int. Cl.[5] G06E *3/00*

U.S. Cl. 395—25 **23 Claims**



1. A highly interconnected optical neural network having capability to learn, said network comprising:

spatial modulating means responsive to an input signal for modulating light to provide modulated optical signals;

detecting means for providing detection signals in response to light incident thereon;

interconnector means for providing a distribution of modulated interconnecting light beams to said detecting means when said interconnector means is illuminated by modulated optical signals from said modulating means so as to

interconnect said modulating means and said detecting means according to a predetermined interconnection pattern, said interconnector means including

projections means adapted to project a distribution of interconnecting beams along paths without changing a parameter of each of said beams relative to the other interconnecting beams projected thereby, and

interconnection weighting means, provided in said paths so as to be illuminated by said interconnecting beams before said parameter of any of said beams has changed, of controlling said parameter of each interconnecting beam relative to the other interconnecting beams to assign an interconnection weight to each said beam and thereby provide weighted, modulated interconnecting beams; and

means responsive to said detection signals for changing a condition of said interconnection weighting means to thereby modify said interconnection weights assigned by said weighting means.

5,068,802

GRAPHIC DRAWING METHOD AND SYSTEM WITH INPUT COORDINATES AUTOMATICALLY ADJUSTABLE

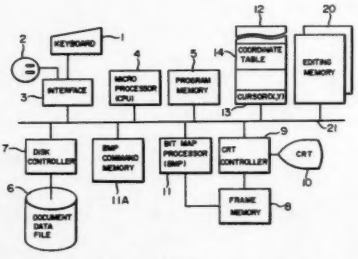
Koujirou Miyashita, Kawasaki, and Tetsuo Machida, Tokyo, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 488,413, Mar. 1, 1990, abandoned, which is a continuation of Ser. No. 226,369, Jul. 29, 1988, abandoned. This application Aug. 3, 1990, Ser. No. 518,249

Claims priority, application Japan, Jul. 30, 1987, 62-191192

Int. Cl.[5] G06F *15/62, 15/60, 3/037*

U.S. Cl. 395—133 **8 Claims**



5. A graphic drawing system for displaying a composite graphic comprised of a plurality of fundamental graphics comprising:

a display screen;

a pointing device for designating a plurality of end points necessary for calculation of drawing line data of each fundamental graphic to be displayed on the display screen;

first means for designating the type of a fundamental graphic to be drawn;

second means for reading input coordinates designated by said pointing device;

third means for comparing said input coordinates with the end point coordinates of each fundamental graphic already displayed on said display screen by referring to a table means for storing said end point coordinates;

fourth means for, if end point coordinates are found near said input coordinates, determining said found end point coordinates as one of the end points of said fundamental graphic to be drawn, and if not, determining said input coordinates as one of the end points of said fundamental graphic to be drawn; and,

fifth means for calculating drawing line data of said fundamental graphic based on the coordinates of each end point after a predetermined number of end points have been designated by said pointing device and for drawing said fundamental graphic on said display screen according to said line data.

5,068,803

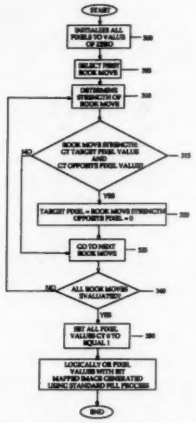
METHOD AND APPARATUS FOR FILLING CONTOURS IN DIGITAL TYPEFACES

Jacobo Valdes, and Eduardo Martinez, both of Palo Alto, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Sep. 15, 1989, Ser. No. 407,911

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—150 **18 Claims**


START
INITIALIZE ALL PIXELS TO VALUE OF ZERO
SELECT FIRST ROOK MOVE
DETERMINE STRENGTH OF ROOK MOVE
ROOK MOVE STRENGTH OF TARGET PIXEL VALUE AND OF OPPOSITE PIXEL VALUE?
NO
YES
TARGET PIXEL = ROOK MOVE STRENGTH OPPOSITE PIXEL = 0
GO TO NEXT ROOK MOVE
NO
ALL ROOK MOVES EVALUATED?
YES
SET ALL PIXEL VALUES OF 0 TO EQUAL 1
LOGICALLY OR PIXEL VALUES WITH BIT MAPPED IMAGE GENERATED USING STANDARD FILL PROCESS
END

1. A computer-implemented method for filling in outlines of characters in digital typefaces, each character outline having one or more contours, each contour having a direction, said method comprising the steps of:

breaking down the contours of the characters into a series of rook moves according to the direction of the contour, each rook move having a target and opposite pixel associated with it which are adjacent to the rook move;

generating a first bit map of the character by setting those pixels between rook moves to equal a value of one;

generating a second bit map of the character comprising the steps of:

initializing the pixels of the bit map to zero;

determining the strength of each rook move, the strength of a rook move corresponding to the total number of rook moves in a colinear sequence;

if the strength of the rook move is greater than the target pixel value and the strength of the rook move is greater than the opposite pixel value;

setting the target pixel value to equal the strength of the rook move;

setting the opposite pixel value to equal zero; and

translating the pixel values having a value greater than zero to a value of one thereby providing a second bit map of the character; and

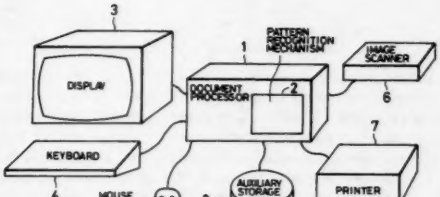
performing a logical OR of the first and second bit maps of the character whereby the resulting bit map is the filled character.

5,068,804

DOCUMENT INPUT METHOD AND APPARATUS

Tan Watanabe, Yokohama; Hideki Nishino, Tsukui; Hidefumi Iwami, Yokohama, and Kuniaki Tabata, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 212,433, Jun. 28, 1988, abandoned.
This application May 7, 1990, Ser. No. 520,133
Claims priority, application Japan, Jul. 3, 1987, 62-165319
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—147 7 Claims



1. A document input method, comprising the steps of:

(a) inputting from an inputting device a sketch comprised of component figures;

(b) displaying said sketch on a display;

(c) selecting one component figure of said sketch;

(d) selecting one figure of fair copy from a plurality of figures of fair copy stored in a memory, the selection of one figure of fair copy being dependent on a correspondence in configuration between said one figure or fair copy and the selected one component figure;

(e) displaying the selected one figure of fair copy in a superposed manner, such that differences between the selected fair copy figure and the selected component figure can be detected by an observer, wherein the plurality of figures of fair copy includes a plurality of different shapes all having a predetermined drawing quality;

(f) inputting from said inputting device a modifying command for modifying at least one of said one component figure and said one figure of fair copy which are displayed on said display in the superposed arrangement;

(g) modifying at least one of said one component figure and said one figure of fair copy in response to said modifying command, wherein said modifying includes,

scaling up or down at least one of said one component figure and said one figure of fair copy on said display, responsive to information included in said modifying command,

selecting for movement at least one of said one component figure and said one figure of fair copy from a present position thereof displayed to a new position on said display, responsive to information included in said modifying command,

selecting for deletion at least one of said one component figure and said one figure of fair copy displayed on said display;

(h) repeating steps (c) to (g) until all component figures comprising the sketch have been selected; and

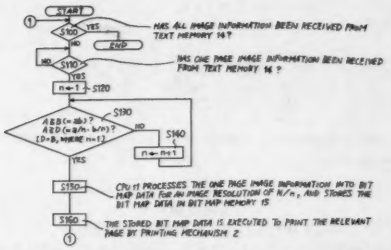
(i) generating a new document of a predetermined quality based on the inputted sketch, wherein said document includes a plurality of at least one of the component figures and the fair copy figures.

5,068,805

DATA PROCESSOR FOR PROCESSING ORIGINAL IMAGE INFORMATION INTO BIT MAP DATA, HAVING MEANS FOR PERMITTING THE BIT MAP DATA TO BE ALWAYS STORED IN VARYING-CAPACITY MEMORY

Toru Tsuzuki, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 24, 1989, Ser. No. 397,841
Claims priority, application Japan, Sep. 17, 1988, 63-233063
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—164 12 Claims



1. An image data processor for processing image information representative of images, into bit map data to be used by an output device to output said images with a predetermined output resolution, and storing the bit map data into a bit map memory of memory means, for subsequent use by said output device, said memory means being used to also store data other than said bit map data, and said bit map memory consisting of an empty area of said memory means which varies with a volume of said data other than said bit map data, so that a memory capacity of said bit map memory varies from time to time, said processor comprising:

calculating means for calculating said memory capacity of said bit map memory;

comparator means responsive to said calculating means, for determining whether a memory capacity required for storing first bit map data for outputting said images with a nominal output resolution is larger than said memory capacity of said bit map memory which is calculated by said calculating means;

modifying means responsive to said comparator means, for modifying said first bit map data into second bit map data if said memory capacity required for storing said first bit map data is larger than the calculated memory capacity of said bit map memory, said second bit map data being prepared to output said images with a reduced output resolution lower than said nominal output resolution, such that a memory capacity required for storing said second bit map data does not exceed the memory capacity of said bit map memory.

5,068,806

METHOD OF DETERMINING USEFUL LIFE OF CARTRIDGE FOR AN INK JET PRINTER

Ronald A. Gatten, Pleasanton, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

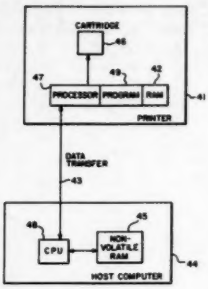
Filed Dec. 2, 1988, Ser. No. 280,781
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—113 33 Claims

1. A method to determine a status of an ink supply and to replace the ink supply in an ink jet printer comprising the steps of:

installing the ink supply in the ink jet printer;

digitally counting a number of ink dots fired from the ink supply;

providing an indication of the status of the ink supply based upon the count; and



installing another ink supply in response to a particular status indication.

5,068,807

PRINTER CONTROLLER

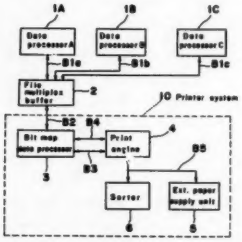
Yoshikazu Ikenoue, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 580,794, Sep. 11, 1990, abandoned, which is a division of Ser. No. 424,526, Oct. 19, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 670,392

Claims priority, application Japan, Oct. 21, 1988, 63-266758; Oct. 21, 1988, 63-266759; Oct. 21, 1988, 63-266760; Oct. 21, 1988, 63-266761; Nov. 12, 1988, 63-286358; Nov. 12, 1988, 63-286359

Int. Cl.[5] G06K *15/00*

U.S. Cl. 395—115 **12 Claims**



1. Printer controller for controlling a printer being connectable to plural host machines responsive to control data sent from either one of them comprising:

a receiving means for receiving control data sent from individual host machines;

a first memory means for memorizing received control data;

a record control means for controlling recording action of images responsive to the control data stored in said first memory means;

a second memory means for memorizing the control data stored in said first memory means in one of plural memory areas assigned to respective host machines; and

a memory control means for saving the control data having been stored in said first memory means into the memory area of said second memory means corresponding to the host machine after the completion of the recording action responsive to said control data when another control data is received by said receiving means from another host machine and for moving the control data having been stored in the memory area of said second memory means corresponding to said another host machine to said first memory means.

5,068,808

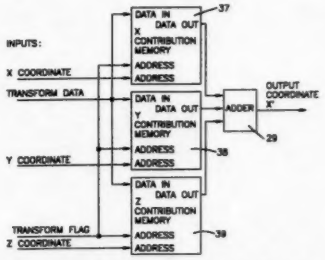
IMAGER AND PROCESS

Robert H. Wake, Solon, Ohio, assignor to Reality Imaging Corporation, Solon, Ohio

Filed Nov. 22, 1988, Ser. No. 274,912

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—119 **11 Claims**



1. A coordinate transform engine for transforming an image made up of a set of points, each point represented by at least an initial coordinate n-tuple, said transform engine comprising:

a plurality of parallel transform memories addressable by a respective coordinate of the n-tuple and a transform flag of at least one bit, said memories each providing as an output an intermediate value in response to said coordinate and said transform flag, said transform flag corresponding to different portions of said image and selecting one of a plurality of transformations for said portions; and

at least one adder receiving the output intermediate values from a subset of said memories, the sum from said adder being a single coordinate of a transformed coordinate n-tuple, whereby said portions can be separately manipulated.

5,068,809

FORMATTING SYSTEM

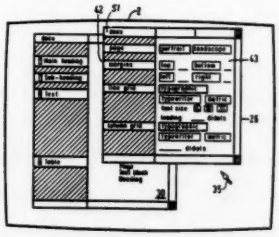
Paulus W. E. Verhelst, Venlo, Netherlands; Werner J. Winiger, Richterswil, Switzerland, and René F. A. Collard, Gennep, Netherlands, assignors to Oce-Nederland B.V., Netherlands

Filed Mar. 1, 1990, Ser. No. 486,800

Claims priority, application Netherlands, Mar. 2, 1989, 8900519

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—145 **3 Claims**



1. Desktop publishing system to prepare and manage documents to a model distinguished by graphic properties, comprising:

a. inputting means for inputting commands and document information relating to graphic elements; and

b. a processing unit operable, by reference to said document information and commands, to use a model having a number of sets of grid lines, equidistant oriented per set to define a grid line spacing, for positioning the input document information, at least some of these sets being allo-

cated different orientation directions, and comprising means for registering input data to adjust said grid line spacing and orientation direction applicable per set, and means for positioning graphic elements, said positioning means using a last grid line used as a reference line, said positioning means further taking into account format data of graphic elements positioned with respect to said reference line, format data of graphic elements still to be positioned with respect to a following grid line, and a certain spacing between graphic elements positioned with respect to said reference line and graphic elements still to be positioned with respect to said following grid line, for selection from the grid lines following the first mentioned reference line the next grid line which is to be considered as a subsequent reference line for the graphic elements still requiring to be positioned.

5,068,810

PROCESS FOR THE DETERMINATION OF COLORIMETRIC DIFFERENCES BETWEEN TWO SCREEN PATTERN FIELDS PRINTED BY A PRINTING MACHINE AND PROCESS FOR THE COLOR CONTROL OR INK REGULATION OF THE PRINT OF A PRINTING MACHINE

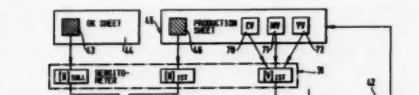
Hans Ott, Regensdorf, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Jul. 9, 1990, Ser. No. 550,092

Claims priority, application Switzerland, Jul. 14, 1989, 2646/89

Int. Cl.[5] G01N *21/25*

U.S. Cl. 364—526 **7 Claims**



2. Process for the color control of ink regulation of the print of a printing machine, wherein measuring fields on production sheets printed by the printing machine are optically detected to determine a color deviation of each measuring field detected from a given set color position and to produce an adjusting value for setting the ink control elements of the printing machine, so that undesirable color variations in production sheets subsequently printed are minimized, comprising the steps of:

printing under nominal conditions, by means of a printing machine, a reference calibration print and several addition calibrating prints, said prints each comprising a plurality of full tone fields and a coprinted half tone field similar in color to desired half tone fields of the production sheets, with each of said addition calibration prints for at least one full tone field having a full tone density differing from that of a corresponding full tone field of similar color of the reference calibration print;

determining, by means of a densitometer, half tone density differences between half tone densities of the half tone field of the reference calibration print and half tone densities of the half tone fields of the addition calibration prints;

determining, by means of a spectrophotometer, colorimetric measure differences between colorimetric measures of the half tone field of the reference calibration print and colorimetric measures of the half tone fields of the addition calibration prints;

substituting values obtained for the half tone density differences and colorimetric measure differences into a matrix equation:

$$[\Delta R]_i = [W] \cdot [\Delta F]_i$$

to determine elements of a colorimetric measure-half tone density transform matrix [W], in which $[\Delta R]_i$ is a half tone difference vector correlated with an addition calibrating print indexed by a value i and having components formed from the half tone density differences for each printing ink, and $[\Delta F]_i$ is a colorimetric measure difference vector with components formed from the colorimetric measure differences;

inverting said colorimetric measure-half tone density transform matrix;

providing a measuring field on an OK sheet and on each production sheet as a half tone field composed of several printing inks;

scanning the half tone field of a production sheet and the OK sheet with a densitometer and determining a difference between associated half tone densities for each half-tone field printing ink involved;

forming a half tone density difference vector having the half tone density differences of said half-tone printing inks as components;

multiplying said half tone density difference vector by said inverted colorimetric measure-half tone density transform matrix, to obtain a color variation vector containing as its components the colorimetric measure differences in a color space uniformly stepped relative to perception;

producing a layer thickness variation control vector from the color variation vector for adjusting ink control elements of the printing machine.

5,068,811

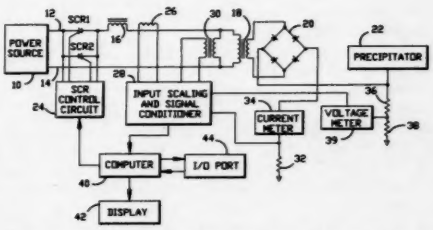
ELECTRICAL CONTROL SYSTEM FOR ELECTROSTATIC PRECIPITATOR

David F. Johnston, Tabb, Va., and Terry L. Farmer, Pleasant Valley, Mo., assignors to BHA Group, Inc., Kansas City, Mo.

Filed Jul. 27, 1990, Ser. No. 558,827

Int. Cl.[5] B03C *3/66*

U.S. Cl. 364—551.01 **73 Claims**



69. The method of detecting and curing fault conditions of an electrostatic precipitator control system, said method comprising:

sensing the waveform electrical characteristics of said control system;

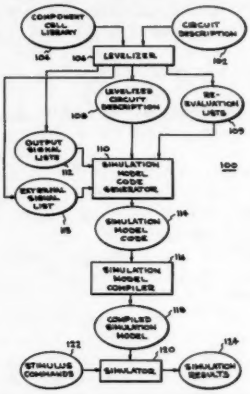
comparing said sensed waveform electrical characteristics with theoretical characteristics to determine system operating efficiency; and

adjusting said system based on said comparisons to maintain said system operation at a desired efficiency by altering the waveform that is being sensed to substantially a desired waveform.

5,068,812
EVENT-CONTROLLED LCC STIMULATION

Thomas J. Schaefer, Cupertino, and Robert D. Shur, Los Altos, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 18, 1989, Ser. No. 381,548
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—578 **7 Claims**



1. A method of simulating operation of a levelized logic circuit, said method comprising the steps of:

storing in a computer memory data representing a specified logic circuit, said logic circuit having a number of nodes between which are connected circuit components, each of said nodes having a signal present thereat with the value of said signal indicating the state of said node; said stored logic circuit data including an assigned logic level for each circuit component;

computing a storing in said computer memory a set of evaluation lists, each said evaluation list corresponding to a signal and denoting those components that are to be evaluated when said signal changes value;

computing and storing in said computer memory an output signal list denoting output signals corresponding to each component of said logic circuit;

computing and storing in said computer memory a list of external input signals to the logic circuit;

whenever an external input signal changes value, storing an evaluation mark for each component in said external input signal's evaluation list; and

for each component, in levelized order, for which an evaluation mark has been stored;

evaluating the component;

clearing the evaluation mark for the component; and

for each signal in the output signal list corresponding to said evaluated component which has a nonempty evaluation list, (A) determining whether the value of the signal was changed by said evaluating step; and (B) if the value of the signal has changed, storing evaluation marks for all of the components in that signal's evaluation list.

5,068,813
PHASED DIGITAL FILTERING IN MULTICHANNEL ENVIRONMENT

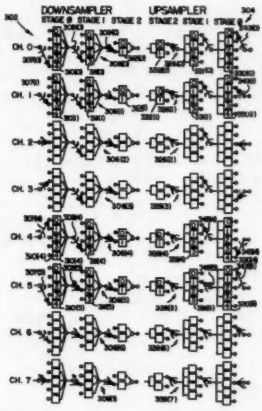
Bradford K. Thoen, Eden Prairie, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Nov. 7, 1989, Ser. No. 432,545
Int. Cl.[5] H04J *15/00*
U.S. Cl. 364—572 **12 Claims**

1. A method for converting signals on a plurality of parallel channels from a first sampling frequency to a second sampling frequency by a digital signal processor, the method comprising:

providing a substantially identical multistage, multirate digital filter for each channel, the filters being in parallel and each stage of each multistage, multirate digital filter including a plurality of subfilters and a commutator indicating a subfilter for execution;

staggering initial commutator positions between the multi-



stage, multirate digital filters at a highest rate stage to avoid coincidence of execution of subfilters between the plurality of multistage, multirate digital filers;

thereafter applying the signal on each channel to the respective multistage, multirate digital filter for the channel;

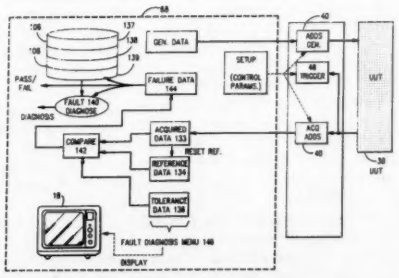
indexing the commutators at the same stage of each multistage, multirate digital filters at the same frequency; and

executing the indicated subfilter with each indexation of its respective commutator.

5,068,814
INTERACTIVE ADAPTIVE INFERENCE SYSTEM

William D. Stark, Ithaca, and Gregory C. Prestas, Candor, both of N.Y., assignors to Array Analysis, Inc., Ithaca, N.Y.

Filed Nov. 7, 1989, Ser. No. 433,612
Int. Cl.[5] G05B *19/02;* **G01K** *31/28*
U.S. Cl. 364—580 **4 Claims**



1. A human interactive adaptive inference system having an operative program for predicting causes of a previously unobserved fault appearing in an electric or electronic device or assembly from relationships with other known and previously stored fault data and information gathered for said electric or electronic device or assembly in prior tests, said adaptive inference system comprising:

a) testing means for performing position dependent, time-

ordered tests upon electrical or electronic devices or assemblies to provide a test data array containing a pattern of faults;

b) storage means defining a reference array containing stored data and information representing patterns of faults of said electric or electronic device or assembly, and data and information patterns of said electrical or electronic device or assembly that conforms to operating requirements, said reference array having means for receiving and incorporating information representative of human judgment, which incorporated information is added to the fault patterns;

c) display means operatively connected to said data array of said testing means and said reference array of said storage means for displaying fault data and information;

d) means operatively connected to said data array of said testing means and said reference array of said storage means for entering human judgment information to said fault patterns to assist in obtaining a diagnostic analysis of said fault patterns; and

e) comparison means operatively connected to said data array of said testing means and said reference array of said storage means for providing a diagnostic analysis of said electrical or electronic device or assembly in accordance with said entered human judgment information, said comparison means being able to discern variances in fault data patterns from data patterns obtained from previously tested conforming electrical and electronic devices or assemblies, whereby said human interactive adaptive inference system is able to learn and predict causes of faults that were not previously experienced or stored within said human interactive adaptive inference system.

5,068,815
OPTICAL FULL ADDER

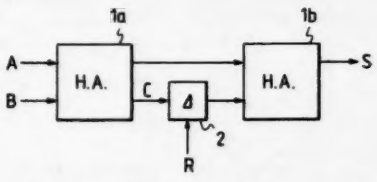
Yoshihiko Mizushima; Kazutoshi Nakajima; Toru Hirohata; Takashi Iida; Yoshihisa Warashina; Kenichi Sugimoto; Tomoko Suzuki, and Hirofumi Kan, all of Shizuoka, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Jun. 21, 1990, Ser. No. 541,309

Claims priority, application Japan, Jun. 23, 1989, 1-161913

Int. Cl.[5] G06F *1/04, 7/50*

U.S. Cl. 364—713 **8 Claims**



1. An optical full adder for performing full addition of signals representing first and second binary numbers, comprising:

a first optical half adder and a second optical half adder, each of the first and second optical half adders having at least first and second input terminals and producing at least two output signals, wherein said first input terminal of said first optical half adder receives the signal representing the first binary number and said second input terminal of said first half adder receives the signal representing the second binary number, and wherein a first output signal produced by the first optical half adder is applied to said first input terminal of the second optical half adder; and

an optical latch memory, the optical latch memory receiving a second output signal produced by the first optical half adder and producing an output signal to be applied to said second input terminal of the second optical half adder; wherein

the signals representing the first and second binary numbers, and the output signals of the first optical half adder, the second optical half adder and the optical latch memory are optical signals.

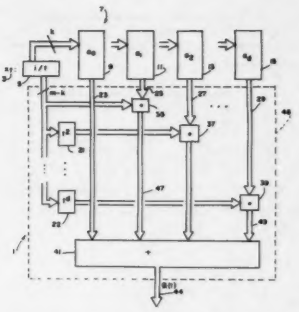
5,068,816
INTERPLATING MEMORY FUNCTION EVALUATION

Andrew S. Noetzel, 59 Sunnyside Dr., Yonkers, N.Y. 10705

Filed Feb. 16, 1990, Ser. No. 480,970

Int. Cl.[5] G02F *7/38*

U.S. Cl. 364—718 **5 Claims**



1. An interpolating memory function evaluation apparatus, comprising: a memory address means for accessing a memory unit by using first bits of a function argument for the memory unit address, an approximating means for obtaining parameters of an approximating function from the memory unit, and an evaluating means for evaluating the approximating function, using other bits of the function argument, the specific approximating function whose parameters were obtained from the memory unit, wherein the accessing comprises using k bits of the function argument to address the memory unit wherein the memory unit contains polynomial coefficients, wherein the evaluating comprises evaluating with fixed combinational logic a degree d-polynomial whose coefficients are obtained from the memory unit, using as the polynomial argument the bits of the function argument of lower order than the k bits used to address the memory unit, wherein the evaluation of the polynomial is performed using as an input to a polynomial evaluator a value t comprised of bits of the function argument of lower order than the k bits used to address the memory unit, computing the quantities t^2, t^3, . . . , t^d in fixed combinational logic, computing terms of the polynomial in a set of multipliers operating in parallel, whose inputs are the coefficients obtained from the memory unit and the powers of t, and adding terms of the polynomial.

5,068,817
NON-RECURSIVE HALF-BAND FILTER WITH COMPLEX VALUED COEFFICIENTS FOR COMPLEX INPUT AND OUTPUT SIGNALS

Heinz Göckler, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

PCT No. PCT/DE88/00020, § 371 Date Aug. 18, 1989, § 102(e) Date Aug. 18, 1989, PCT Pub. No. WO88/06381, PCT Pub. Date Aug. 25, 1988

PCT Filed Jan. 16, 1988, Ser. No. 408,516

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705206

Int. Cl.[5] G06F *15/31*

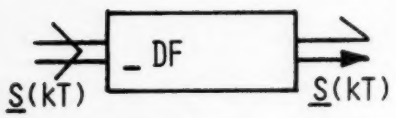
U.S. Cl. 364—724.16 **7 Claims**

1. A non-recursive half-band filter having a filter length N, comprising:

at least one input and an output, said input for receiving a complex input signal $s_I(kT)$ having a real component s_{rI}

and an imaginary component s_{jI} at a sampling frequency fA, where $fA = 1/T$; and

means for processing and converting the received complex



input signal $s_I(kT) = s_{rI} = js_{jI}$ into a complex output signal s(kT), where K is a running index, without changing the sampling frequency, said processing and converting means operates according to the equation:

$$\begin{aligned} s(kT) &= s_1(kT) * h(l) \\ &= s_{rI}(k) * h_r(l) - s_{jI}(k) * h_i(l) + \\ &\quad j[s_{rI}(k) * h_i(l) + s_{jI}(k) * h_r(l)] \end{aligned}$$

and includes means for modulating a pulse response h(l), where $l = -(n-1)/2$ to $(N-1)/2$ and N is an odd filter length, onto a complex carrier at a frequency of $\pm\frac{1}{4}$ of the sampling frequency to yield:

$$h(l) = h(l) \cdot e^{j(\pm 2\pi l[A/4fA + \phi 0)} = j^{\pm l} \cdot e^{j\phi 0} \cdot h(l)$$

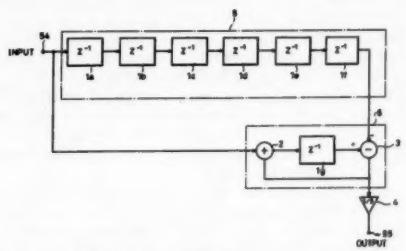
where the null phase $\phi 0$ of this frequency is an integer multiple m of $\pi/2$ ($100\ 0 = m \cdot \pi/2$ where m = 0,1,2,3...) wherein said modulating means includes, for real component inputs and imaginary component inputs; a respective chain of $(N-1)/2$ delay members having a center delay member where each sample of the real component and the imaginary component of the input signal s(kT) is routed into the respective chain of $(N-1)/2$ delay members having delay times of 2T, with the center delay member being divided into two members having a delay time of T; respective difference signal forming means for subtracting from the output signal of the last delay member of the respective chain the input signal of the first delay member of the respective chain to form a first respective difference signal, subtracting from the output signal of the penultimate delay member of the respective chain the input signal of the second delay member of the respective chain to form a second respective difference signal, subtracting from the output signal of the third to last delay member of the respective chain the input signal of the third delay member of the respective chain to form a third respective difference signal, and so on until the output signal of each delay member is processed; respective weighting means for weighting said respective difference signals by a value equal to a function of the pulse response h(l); respective means for summing the respective weighted difference signals via an adder to yield either a term of the real or the imaginary component of the filter output signal s(kT); and respective means for outputting an output signal from the center delay member of the respective chain, after a delay of $T \cdot (N-1)/2$, said output signal being weighted with a value equal to a function of h(0), which results in a term of the imaginary component or the real component of the filter output signal s(kT).

5,068,818

HARDWARE IMPLEMENTED MOVING AVERAGE PROCESSOR

Shinichi Uramoto, and Hideyuki Terane, both of Hyogo, Japan, assignors to Mitbushi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1990, Ser. No. 461,966
Claims priority, application Japan, Jun. 6, 1989, 1-144784
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—734 **11 Claims**



1. A device for finding a moving average of a series of data sampled at a predetermined sampling period, comprising:

first delay means for sequentially receiving said series of data and for delaying each of the data by a time period corresponding to N sampling periods to output a result of the delay, N being an integer;

adding means having one input receive sequentially each data of said series of data;

second delay means for delaying an output of said adding means by a time period corresponding to one sampling period to output a result of the delay;

subtracting means for carrying out subtraction between an output of said second delay means and that of said first delay means; and

means for dividing an output of said subtracting means by a coefficient $(N-1)$ to produce a moving average output of said device,

said adding means having the other input receive the output of said subtracting means for adding the data supplied to said one input and said subtracting means output to output a result of the addition.

5,068,819

FLOATING POINT APPARATUS WITH CONCURRENT INPUT/OUTPUT OPERATIONS

Mamata Misra; Robert J. Urquhart; Michael T. Vanover, and John A. Voltin, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 211,387, Jun. 23, 1988, abandoned. This application Jan. 24, 1991, Ser. No. 647,183
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—736 **28 Claims**

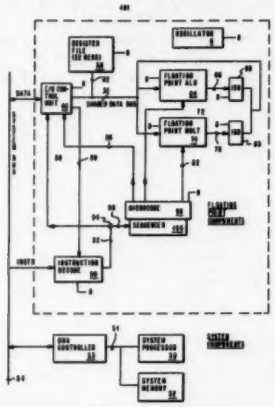
1. In a data processing system, a method for performing a series of operation sequences in a plurality of contiguous general purpose registers and an arithmetic logic unit and providing a final result to an information bus for each operation sequence, said method comprising the steps of:

assigning each of said plurality of contiguous general purpose registers to uniquely store parameters, intermediate results of operations in the sequence and a final operation sequence result;

computing results in said arithmetic logic unit for each of said sequence operations in the series consecutively;

storing results from each sequence operation in its assigned register after each sequence operation computation; and

outputting to said information bus the final operation sequence result from its assigned register of a preceding



sequence simultaneously with the computation of a next sequence operation result in its assigned register.

5,068,820

DATA TRANSFER SYSTEM HAVING TRANSFER DISCRIMINATION CIRCUIT

Satoshi Nojima; Kazuo Sakagawa, both of Kawasaki, and Hideo Suzuki, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

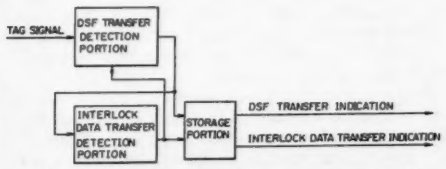
PCT No. PCT/JP87/00787, § 371 Date Jun. 10, 1988, § 102(e) Date Jun. 10, 1988, PCT Pub. No. WO88/02888, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 16, 1987, Ser. No. 221,908

Claims priority, application Japan, Oct. 17, 1986, 61-248007; Oct. 24, 1986, 61-252883; May 2, 1987, 62-107949

Int. Cl.[5] G06F *13/42*

U.S. Cl. 395—275 **14 Claims**



12. A data transfer system for a computer, with an input/output device at a distance therefrom, said system comprising:

a communication path coupled between said computer and said input/output device; and

transfer type discrimination means, coupled to said path, for determining a type of data transfer, responsive to a single tag signal, between the computer and the input/output device as a data streaming feature data transfer or an interlock data transfer by determining whether a first or second predetermined time periods exist where said first predetermined time period is shorter than said second predetermined time period, the first and second predetermined time periods are determined from the leading edge of the single tag signal and existence of said first predetermined time period determines that the type is a data streaming feature data transfer.

5,068,821

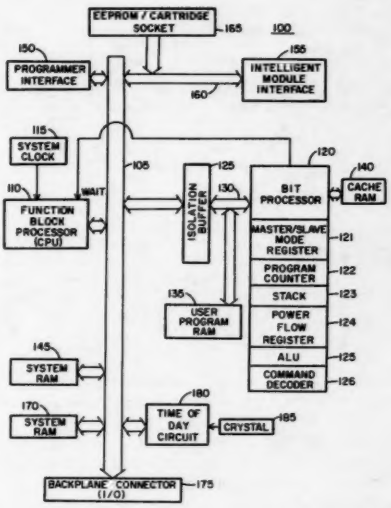
BIT PROCESSOR WITH POWERS FLOW REGISTER SWITCHES CONTROL A FUNCTION BLOCK PROCESSOR FOR EXECUTION OF THE CURRENT COMMAND

Daniel W. Sexton, Charlottesville, Va., and William F. Bentley, Ft. Collins, Colo., assignors to GE Fanuc Automation North America, Inc., Charlottesville, Va.

Filed Mar. 27, 1989, Ser. No. 329,151

Int. Cl.[5] G06F *9/46, 15/16*

U.S. Cl. 395—800 **8 Claims**



1. A programmable logic controller comprising:

a function block processor for processing high level commands;

a bit processor, coupled to said function block processor, for processing low level commands, said bit processor being coupled to a user program memory containing a user program having a sequence of commands having OPCODES and OPERANDS associated therewith, said bit processor including a power flow register, said bit processor including a program counter containing an instruction pointer which points to a command OPCODE in user program memory to be processed;

said bit processor including decoding means for decoding the OPCODE of a command in said program memory, said command being referred to as the current command;

said bit processor including means for relinquishing control to said function block processor to processor said current command if for said current command at least one of the following conditions is true:

1. power flow is indicated in said power flow register;
2. said current command is a function block which must be executed by said function block processor;

said bit processor including instruction pointer adjusting means for waiting until said function block processor has retrieved the instruction pointer from the bit processor and then adjusting said instruction pointer to point to the next OPCODE in said program memory,

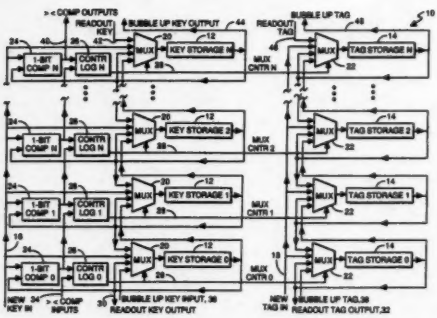
said bit processor including means for causing said bit processor itself to process said current command if neither of said conditions 1 and 2 is true, said bit processor advancing said instruction pointer in such instance to point to the next OPCODE in said program memory.

5,068,822

SINGLE-STAGE EXTENSIBLE SORTER FOR SORTING DATA AND EFFICIENTLY READING OUT SORTED DATA, INCORPORATING SINGLE-BIT DEVICES

Richard H. Lawrence, Hudson, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 16, 1988, Ser. No. 168,974
Int. Cl.[5] G06F 7/02, 7/04, 7/22, 7/24
U.S. Cl. 395—775 9 Claims



1. A hard-wired circuit for sorting data comprising

input means to input a new multibit word of a series of multibit words to be sorted,

a plurality of storage devices, each of said plurality of storage devices comprising means for storing a multibit word of said series of multibit words to be sorted,

a plurality of comparators, each one of said plurality of comparators being connected to receive a multibit word stored in one of said plurality of storage devices and said new multibit word from said input means and to compare said multibit word stored in said one of said plurality of storage devices and said new multibit word simultaneously with comparisons of other ones of said plurality of comparators and provide a comparison output, wherein each one of said plurality of comparators is a single-bit comparator connected to serially receive and compare bits of said new multibit word and said multibit word stored in said one of said plurality of storage devices, and

control means for identifying, based on information contained in said comparison output of each of said plurality of comparators, an identified one of said plurality of storage devices into which said new multibit word is to be stored in proper position with respect to sorted multibit words stored in other storage devices, and for storing said new multibit word in said identified one of said plurality of storage devices,

wherein said control means includes means for simultaneously shifting sorted multibit words stored in said plurality of storage devices to adjacent storage devices to make room for said new multibit word,

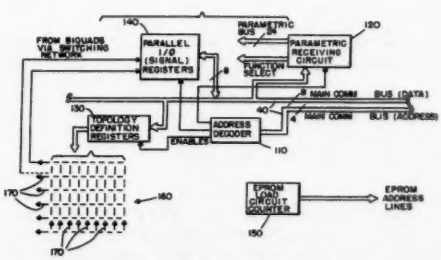
wherein said control means comprises a plurality of multiplexers, each one of said plurality of multiplexers being connected to selectively cause to be stored in a first of said plurality of storage devices either said new multibit word from said input means or a sorted multibit word stored at a second of said plurality of storage devices adjacent to said first of said plurality of storage devices, depending upon a comparison output of one of said plurality of comparators.

5,068,823

PROGRAMMABLE INTEGRATED CIRCUIT USING TOPOLOGICAL AND PARAMETRIC DATA TO SELECTIVELY CONNECT AND CONFIGURE DIFFERENT HIGH LEVEL FUNCTIONAL BLOCKS THEREOF

Jeffrey I. Robinson, New Fairfield, Conn., assignor to Star Semiconductor Corporation, Warren, N.J.

Filed Jul. 11, 1988, Ser. No. 217,616
Int. Cl.[5] G06F 15/20, 9/00
U.S. Cl. 395—500 20 Claims



1. A programmable integrated circuit real time signal processor apparatus which interfaces with a communications bus, said signal processor apparatus comprising:

(a) a plurality of high level functional block means including at least two of filter means, digital to analog converter means, rectifier means, modulator means, microprocessor means, and other high level processing means, each of said plurality of functional block means for performing in real time a different operation on signal data received by said functional block means, said plurality of functional block means having different basic configurations and structures and resultingly different high level functions and capabilities, wherein the operation of each high level functional block means is affected by internal parameters provided to the functional block means;

(b) a core means comprising interface means for interfacing with said communications bus, processing means for distinguishing between at least topological and parametric data received by said core means over said communications bus, and matrix switching means for interconnecting said plurality of functional block means in a desired manner in response to said topological data received over said communications bus and thereby controlling the specific interconnection between the high level functional block means and hence the functionality of said signal processor apparatus, wherein parametric data received by said processing means is sent by said processing means via a parametric bus to a plurality of said functional block means to control respective of said internal parameters and resultingly the operational characteristics of said plurality of functional block means;

(c) timing function means for receiving timing signals from a timing generator and for controlling the sequential flow of at least said signal data in response thereto in order to maintain real time signal processing.

5,068,824

METHOD OF SETTING THE OPERATING PARAMETERS IN A MICROPROCESSOR-CONTROLLED TYPEWRITER OR OTHER MICROPROCESSOR-CONTROLLED OFFICE MACHINE

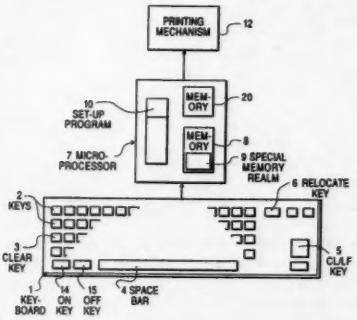
Franz Kreutzburg, Zetel, and Kurt-G. Galleck, Wilhelmshaven, both of Fed. Rep. of Germany, assignors to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,497

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729097

Int. Cl.[5] G06F *3/02, 3/06, 3/12*

U.S. Cl. 395—800 15 Claims



1. A method of setting operating parameters in a microprocessor-controlled typewriter or like office machine having a microprocessor, a data input keyboard which includes (i) a printer-advance actuator, (ii) a first command actuator, (iii) a second command actuator, and (iv) a set-up initiating actuator, a memory for storing operating parameters for the typewriter, a record carrier, and a printing apparatus for selecting and printing the operating parameters and selectable values available therefor on the record carrier, including the steps of:

(a) recalling from the memory a set-up plane which lists a plurality of sub-planes containing the operating parameters and selectable values for the operating parameters in response to actuating the set-up initiating actuator;

(b) printing the set-up plane on the record carrier with the printing apparatus;

(c) moving the printing apparatus to a position adjacent to an indicia corresponding to a selected sub-plane by actuating the printer-advance actuator;

(d) recalling from memory the selected sub-plane, printing the operating parameters and values available for the operating parameters of the selected sub-plane upon the record carrier and positioning the printing apparatus at a location corresponding to one of the parameters printed on the record carrier in response to actuating the first command actuator;

(e) moving the printing apparatus to a position corresponding to a selected one of the available values of the one parameter by actuating the printer-advance actuator; and

(f) selectively: (i) storing the selected one of the available values of the one parameter in the memory and moving the printer apparatus to a location corresponding to another parameter printed on the record carrier and repeating steps (e) and (f) with respect to that parameter in response to actuating the first command actuator; and (ii) storing the selected one of the available values of the one parameter, recalling from the memory the set-up plane, and causing the printing apparatus to print the set-up plane on the record carrier in response to actuating the second command actuator.

5,068,825

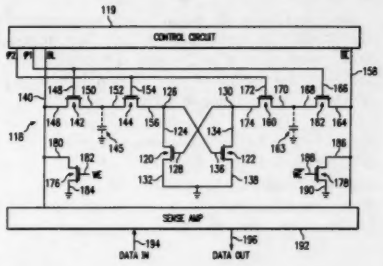
MEMORY CELL CIRCUIT AND OPERATION THEREOF

Shivaling S. Mahant-Shetti, Richardson, and Mark G. Harward, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 29, 1990, Ser. No. 546,497

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—154 27 Claims



11. A memory cell, comprising:

a cross-coupled transistor pair for storing a data value;

a first transistor series pair coupled to a first node of said storage device, and operable in a first mode pull up a voltage at said first node by transferring a predetermined voltage level to said first node and in a second mode to provide electrical access to said first node for read/writing said storage device;

a second transistor series pair coupled to a second node of said storage device, and operable in the first mode to pull up a voltage at said second node by transferring a predetermined voltage to said second node and in the second mode to provide electrical access to said second node for read/writing said storage device; and

a clocking circuit for alternatively clocking the transistors of said first and second transistor pairs in a non-overlapping fashion during said first mode;

a supply circuit for providing the predetermined voltage to both of said first and second transistor pairs during said first mode; and

a conduct circuit for causing each of said transistor pairs to conduct during said second mode.

5,068,826

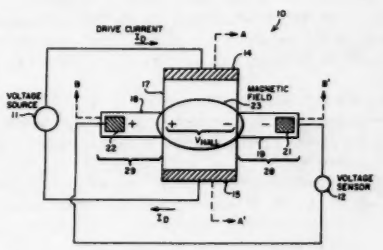
HALL EFFECT SEMICONDUCTOR MEMORY CELL

James A. Matthews, Milpitas, Calif., assignor to MicroUnity Systems Engineering, Palo Alto, Calif.

Division of Ser. No. 466,787, Jan. 18, 1990. This application Jan. 11, 1991, Ser. No. 640,075

Int. Cl.[5] G11C *11/18*

U.S. Cl. 365—170 13 Claims



1. A non-volatile, static magnetic semiconductor memory device comprising:

a substrate of one condutivity type;

a pair of spaced-apart regions of opposite conductivity type formed in said substrate, said spaced-apart regions defining a channel therebetween;

a gate member for producing an inversion layer across said channel whenever a predetermined voltage is applied to said gate member;

current sourcing means for flowing a current across said inversion layer from one of said spaced-apart regions to the other;

a pair of base regions of said opposite conductivity type forming a junction in said substrate on opposite sides of said channel such that each of said base regions make ohmic connection to said inversion layer;

a pair of emitter regions of said one conductivity type each of which forms a junction with one of said base regions; and

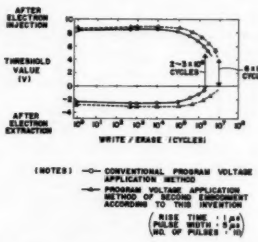
a magnetic patch formed above said gate member for storing information in a magnetic field whose flux lines are substantially transverse to said current, said magnetic field producing a Hall voltage in said inversion layer which is sensed by said base regions.

5,068,827

METHOD OF APPLYING A PROGRAM VOLTAGE FOR A NON-VOLATILE SEMICONDUCTOR MEMORY AND APPARATUS FOR IMPLEMENTING THE SAME

Seiji Yamada, Tokyo, and Kiyomi Naruke, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1989, Ser. No. 448,358
Claims priority, application Japan, Jan. 20, 1989, 1-11186
Int. Cl.[5] G11C *11/40, 13/00*
U.S. Cl. 365—189.01 **5 Claims**


AFTER ELECTRON INJECTION
THRESHOLD VALUE (V)
AFTER ELECTRON EXTRACTION
2~3×10⁴ CYCLES
6×10⁴ CYCLES
WRITE / ERASE (CYCLES)
(NOTES) CONVENTIONAL PROGRAM VOLTAGE APPLICATION METHOD
PROGRAM VOLTAGE APPLICATION METHOD OF SECOND EMBODIMENT ACCORDING TO THIS INVENTION
RISE TIME : 1 μs
PULSE WIDTH : 5 μs
NO. OF PULSES : 10

3. A method of applying a voltage pulse for carrying out the injection/extraction of electrons into/from a non-volatile semiconductor memory in which high and low levels of a threshold voltage corresponding to the presence and absence of the storage of electrons are caused to correspond to binary information,

the method comprising the steps of:

generating a plurality of rectangular voltage pulses, each pulse having a predetermined voltage level and a predetermined width,

chopping each rectangular pulse generated by the generating means to form narrow pulses, the narrow pulses each having the ability of interjecting or extracting only a portion of all electrons to be stored; and

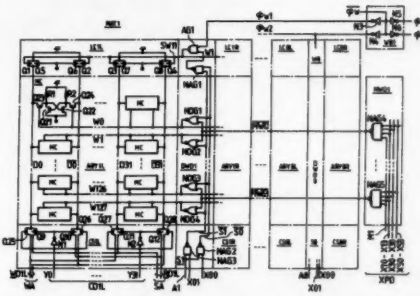
applying the plurality of voltage pulses to the non-volatile semiconductor memory, thereby to inject or extract all of the electrons.

5,068,828

SEMICONDUCTOR MEMORY DEVICE

Shuuichi Miyaoka, Ohme; Masanori Odaka, Kodair; Toshikazu Arai, Maebashi, and Hiroshi Higuchi, Takasaki, all of Japan, assignors to Hitachi, Ltd.; Hitachi Microcomputer Engineering, Ltd. and Akita Electronics Co., Ltd., all of Tokyo, Japan

Continuation of Ser. No. 228,021, Aug. 4, 1988, Pat. No. 4,935,898. This application Jun. 19, 1990, Ser. No. 540,480
Claims priority, application Japan, Oct. 2, 1987, 62-249578
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.01 **45 Claims**



1. A semiconductor integrated circuit device comprising: a first node for receiving a first voltage;

a second node for receiving a second voltage smaller than the first voltage;

word lines;

a pair of data lines;

memory cells of static type coupled to the word lines and the pair of data lines so that each memory cell is coupled to one word line and the pair of data lines;

a variable impedance circuit coupled between the first node and the pair of data lines and controlled such that its impedance becomes relatively high when the device is in a data write-in mode in comparison with its impedance in a data read-out mode, the variable impedance circuit including:

a first pair of P-channel MOSFETs in which the source-drain paths thereof are coupled between the first node and the pair of data lines, respectively, and the gates thereof are coupled to the second node, whereby the first pair of P-channel MOSFETs are turned on in response to the application of the first and second voltages to the first and second nodes, respectively, and

a second pair of P-channel MOSFETs in which the source-drain paths thereof are coupled between the first node and the pair of data lines, respectively, and the gates thereof are coupled to receive a control signal, whereby the second pair of P-channel MOSFETs are turned on in the data read-out mode and turned off in the data write-in mode;

a data input circuit which is activated in the data write-in mode and which includes means for changing a level of either one of the pair of data lines to a level substantially equal to the second voltage;

a data output circuit which is activated in the data read-out mode;

a pair of write data lines coupled to outputs of the data input circuit;

a pair of read data lines coupled to inputs of the data output circuit;

a first pair of N-channel MOSFETs for coupling the data input circuit to the pair of data lines via the pair of write data lines in the data write-in mode; and

a third pair of P-channel MOSFETs for coupling the data output circuit to the pair of data lines via the pair of read data lines in the data read-out mode.

5,068,829
SEMICONDUCTOR MEMORY DEVICE

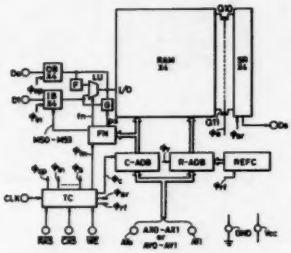
Yasunori Yamaguchi, Tachikawa, and Jun Miyake, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 224,375, Jul. 26, 1988, Pat. No. 4,951,251, which is a division of Ser. No. 874,106, Jun. 13, 1986, Pat. No. 4,766,570. This application Aug. 21, 1990, Ser. No. 570,525

Claims priority, application Japan, Jun. 17, 1985, 60-129826

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—189.07 **11 Claims**



1. A microprocessor system comprising:

a microprocessor for processing image data; and

a semiconductor memory coupled to said microprocessor,

wherein said semiconductor memory comprises:

a memory portion for storing image data,

a logic circuit coupled to said memory portion and having a plurality of operation modes which are respectively selected on the basis of a mode selecting signal,

control means coupled to said logic circuit for controlling said logic circuit,

a first external terminal coupled to said control means for receiving a row address strobe signal,

a second external terminal coupled to said control means for receiving a column address strobe signal,

a third external terminal coupled to said control means for receiving a write enable signal, and

a fourth external terminal coupled to said control means for receiving said mode selecting signal,

wherein a predetermined one of said operation modes is selected by said control means in response to said column address strobe signal being at a logic "low" level and said write enable signal being at a logic "low" level when said row address strobe signal is at a transitional logic level corresponding to a falling edge.

5,068,830
HIGH SPEED STATIC RAM SENSING SYSTEM

William C. Plants, Santa Clara, and Scott N. Fritz, Penn Valley, both of Calif., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed May 9, 1989, Ser. No. 349,564

Int. Cl.[5] G11C *11/41, 7/02;* **G01R** *19/00;* **H03F** *3/45*

U.S. Cl. 365—190 **20 Claims**

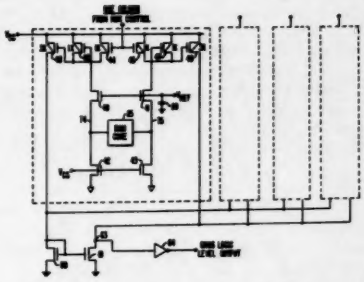
1. A static RAM sensing system comprising

a column of static RAM cells coupled together by a pair of complementary bit lines, each memory cell when accessed coupling only one of said pair of complementary bit lines to a current source, each state of said memory cell determining which bit line is coupled;

a pair of cascode transistors, each having first and second source/drain electrodes and a gate electrode, said first source/drain electrode connected to one of said pair of complementary bit lines;

a pair of current mirrors, each having an input and output terminal, said input terminal of each current mirror connected to a respective second source/drain electrode of said air of cascode transistors, said output terminal carrying a current proportional to a current through said input terminal;

an active load connected to both output terminals of said pair of current mirrors, said active load having an output node responsive to differences in currents through said output terminals; and



an inverter having an inverter input terminal and an inverter output terminal, said inverter input terminal connected to said output node;

whereby the state of said inverter output terminal is determined by the state of an accessed memory cell.

5,068,831
DATA READ CIRCUIT FOR SEMICONDUCTOR STORAGE DEVICE

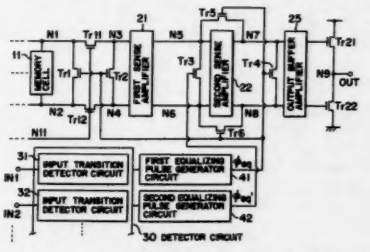
Satoru Hoshi; Masami Masuda, both of Kawasaki, and Takayuki Kawaguchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1990, Ser. No. 550,025

Claims priority, application Japan, Jul. 12, 1989, 1-179816

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—203 **12 Claims**



1. A data read circuit for a semiconductor storage device comprising:

a sense amplifier (22) to which is inputted data of a memory cell (11) selected according to an address via a pair of complementary first data lines (N1 to N6) and outputs the inputted and amplified data to a pair of complementary second data lines (N7, N8);

first switching means (Tr3) for equalizing said pair of complementary first data lines (N5, N6) at the input side of said sense amplifier (22) by making said first data lines conductive with respect to each other;

second switching means (Tr4) for equalizing said pair of complementary second data lines (N7, N8) by making said second data lines conductive with respect to each other;

third switching means (Tr5, Tr6) for equalizing by making said pair of first data lines (N5, N6) at the input side of said sense amplifier (22) and corresponding ones of said pair of second data lines (N7, N8) conductive with respect to each other;

second equalizing pulse generator means (42) for generating

a second equalizing pulse (Φ_{eq}') when said address is changed and for turning on said first switch means (Tr3) by applying said second equalizing pulse to a control terminal of said first switch means; and

first equalizing pulse generator means (41) for generating a first equalizing pulse (Φ_{eq}) when said address is changed and for turning on said second and third switching means (Tr4; Tr5, Tr6) by applying said second equalizing pulse to gate terminals of said second and third switching means;

wherein the load capacitance connected to an output terminal of said second equalizing pulse generator means (42) is set smaller than the load capacitance connected to an output terminal of said first equalizing pulse generating means (41), and

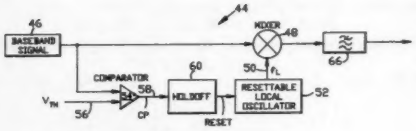
wherein the number of stages of logical circuits constituting said second equalizing pulse generator means (42) is smaller than the number of stages of logical circuits constituting said first equalizing pulse generator means (41), and whereby said second equalizing pulse (Φ_{eq}') from said second equalizing pulse generator means (42) is established earlier than said first equalizing pulse (Φ_{eq}) from said first equalizing pulse generator means (41).

5,068,832

BINAURAL ULTRASOUND DETECTOR AND IMAGER

Thomas I. Kirkpatrick, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 15, 1990, Ser. No. 481,421
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—97 **21 Claims**



1. An apparatus comprising:

generating means for generating a fixed frequency reference signal;

mixing means for mixing said fixed frequency reference signal with a receive signal to translate said receive signal into a translated signal different from said receive signal; and

phase shifting means for shifting the phase of said fixed frequency reference signal to correspond to the phase of said receive signal so that said translated signal is in phase with said receive signal when said fixed frequency reference signal is shifted.

5,068,833

DYNAMIC CONTROL CIRCUIT FOR MULTICHANNEL SYSTEM

David Lipschutz, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

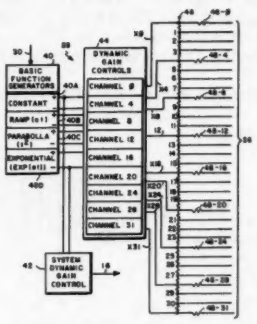
Filed Apr. 11, 1990, Ser. No. 508,219
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—98 **19 Claims**

1. A circuit for dynamically controlling the gain of each input channel of a system having a plurality of input channels to maintain a selected apodization profile with predetermined time-variances in channel aperture size, the circuit comprising:

means for controlling the gain for each channel;

means for generating a plurality of basis time-varying functions;

means for combining at least selected ones of said basis functions by appropriately weighting each selected function and adding the weighted functions to obtain a signal having the dynamic gain characteristic for a given channel required for the selected apodization profile; and



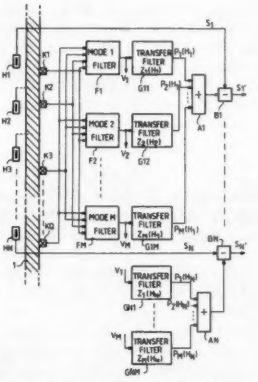
means for applying the appropriate signal to control the gain control means for each channel.

5,068,834

METHOD AND DEVICE FOR CORRECTING THE SIGNALS GIVEN BY THE HYDROPHONES OF AN ANTENNA

Bernard Fromont, Contes, France, assignor to Thomson-CSF, Puteaux, France

Filed May 24, 1990, Ser. No. 527,939
Claims priority, application France, Jun. 2, 1989, 89 07303
Int. Cl.[5] H04B *1/06*
U.S. Cl. 367—135 **4 Claims**



1. A device for the correction of signals output by hydrophones of an antenna mounted on a wall, comprising a plurality of vibration sensors mounted on the wall at the antenna and, for each hydrophone, a processing means followed by an adder to give a correction signal as a function of output signals delivered by the sensors and a subtractor to subtract a correction signal from the signal output by each hydrophone, wherein each processing circuit comprises, in series, a mode filter which carries out a weighted addition of signals output by the sensors and a transfer filter.

5,068,835

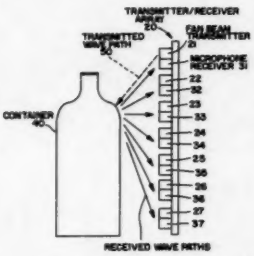
ACOUSTIC HOLOGRAPHIC ARRAY MEASUREMENT DEVICE AND RELATED MATERIAL

Michael A. Reed, Portsmouth, N.H., assignor to Environmental Products Corporation, Fairfax, Va.

Continuation of Ser. No. 413,941, Sep. 28, 1989, abandoned. This application Sep. 17, 1990, Ser. No. 584,507

Int. Cl.[5] B07C *5/00*

U.S. Cl. 367—135 16 Claims



1. An acoustic device for measuring the shaped of an object comprising:

transmitter means including a series of transmitters disposed in a spaced sequence, for transmitting an acoustic signal from each of the spaced transmitters in sequence toward an object to be measured;

receiver means for receiving a signal reflected by the object while said transmitter means is not transmitting between the signal transmissions during said sequence of acoustic signals;

measurement means for measuring phase data of said reflected signal received by said receiver means;

calculator means for calculating values representing the shape of the object as a function of said phase data; and

means for comparing said values with predetermined reference values to identify the shape of the object.

5,068,836

SOUND GENERATING TRANSDUCER

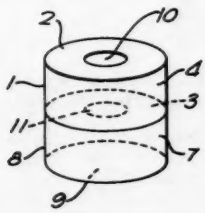
Geoffrey Steel, Bristol, England, assignor to British Aerospace Public Limited Company, London, England

Filed Sep. 19, 1990, Ser. No. 584,932

Claims priority, application United Kingdom, Oct. 6, 1989, 8922581

Int. Cl.[5] H04R *17/00*

U.S. Cl. 367—174 7 Claims



1. A Flextensional sonar transducer comprising a first cavity defined by an elliptical shell and end plates covering the two ends of the shell, vibration drive means inside the cavity and coupled between portions of the shell wall at opposite ends of the major axis of the shell, a second cavity connected to the first cavity and an opening between the two cavities for coupling the two cavities for the second cavity to affect the resonant frequency of the first cavity.

5,068,837

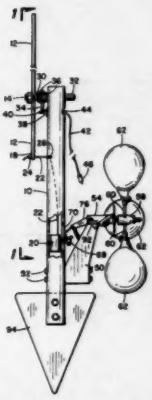
COMBINED RACING KITE GATE AND QUICK DRAW DEVICE

Arlen J. Lowrance, 2121 S. Yorktown, #802, Tulsa, Okla. 74114

Continuation-in-part of Ser. No. 603,443, Oct. 26, 1990, Pat. No. 5,018,117. This application Feb. 11, 1991, Ser. No. 653,051

Int. Cl.[5] G04B *47/00;* A63H *27/08*

U.S. Cl. 368—10 13 Claims



1. A racing gate for kites comprising a vertical pipe having an upper end and a lower end, the lower end supporting the pipe from the ground, an elongated wand having an upper end and a lower end, means for pivotally attaching the wand above its lower end to the pipe adjacent its upper end, a weight slidably mounted within said pipe, and a cord connected from the lower end of said wand to said weight for maintaining said wand in a normally vertical condition.

5,068,838

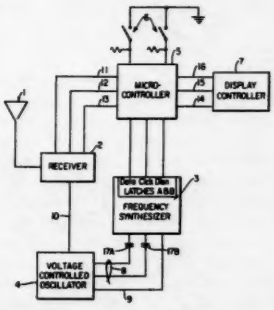
LOCATION ACQUISITION AND TIME ADJUSTING SYSTEM

Judah Klausner, Sagaponack, N.Y., and Robert Hotto, La Jolla, Calif., assignors to Klausner Patent Technologies, Sagaponack, N.Y.

Filed Jul. 18, 1990, Ser. No. 555,268

Int. Cl.[5] G04C *11/02;* H04B *7/185*

U.S. Cl. 368—47 42 Claims



1. A portable timekeeping system, comprising:

receiving means for receiving broadcast radiowave frequencies;

storing means for storing information indicative of sets of radiowave frequencies which are transmitted from prede-

termined locations so that each set corresponds to a respective one of said predetermined locations;

matching means for matching said received broadcast radiowave frequencies from said receiving means with a matching one of said sets of radiowave frequencies; and

timekeeping means for updating time indicative of a local time where said received broadcast radiowave frequencies were transmitted based on matching from said matching means.

5,068,839

RESETTABLE SANDGLASS-TYPE TIMING DEVICE WHICH PROVIDES SELECTIVE TIMING PERIODS

Gary Rolfe, Basingstoke, Great Britain, assignor to Neil Lawrence, Australia

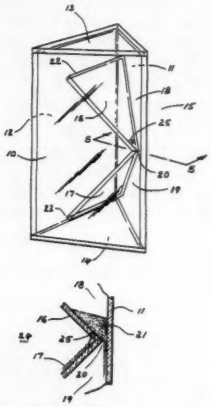
PCT No. PCT/AU88/00226, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO89/00721, PCT Pub. Date Jan. 26, 1989

PCT Filed Jun. 30, 1988, Ser. No. 459,765

Claims priority, application United Kingdom, Jul. 16, 1987, 8716838; Dec. 31, 1987, 8730361; May 5, 1988, 8810548

Int. Cl.[5] G04F *1/04*

U.S. Cl. 368—93 **4 Claims**



1. A timing device which comprises a casing in the form of a hollow prism which is formed at least in part from a transparent material, two partitions located within the casing and co-operating with wall portions of the casing to form first and second chambers which converge in a direction toward one another, a passageway interconnecting divergent ends of the chambers, a narrow neck interconnecting convergent ends of the two chambers, and a flowable material located within the device and moveable under the influence of gravity from one chamber or the other by way of the neck or, as an alternative to passing through the neck, in an unimpeded manner by way of the passageway, one of the partitions having a port therein located adjacent the neck, the port interconnecting the first chamber and the passageway such that a portion of the flowable material will transfer from the first chamber to the passageway at the same time that the material is flowing from the first to the second chamber.

5,068,840

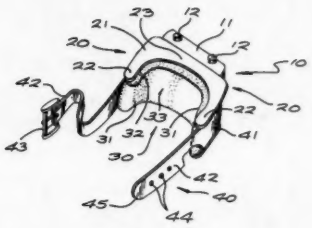
PILOT'S WRIST MOUNT FOR CARRYING A TIMPEPIECE OR THE LIKE VERTICALLY ON THE RADIAL ASPECT OF THE WRIST

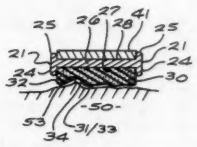
John H. Buckner, 3590 E. Imperial Hwy., Lynwood, Calif. 90262

Filed Oct. 10, 1989, Ser. No. 419,118

Int. Cl.[5] A44C *5/00*; G04B *37/00*

U.S. Cl. 368—281 **28 Claims**





1. A wrist mount, for a timepiece or the like, and particularly useful in a specialized activity in which a user's forearm is held with the radial aspect of the wrist oriented toward the user's eyes; said mount comprising:

a casing that fits loosely upon the radial aspect of a human wrist, generally out of contact with the wrist, and has inward-directed retaining flanges extending from the casing, along two opposed edges thereof, toward the wrist;

a wristband for securing the casing to the wrist; and

an insert pad, disposed and retained within the casing and between the retaining flanges, and having a portion extending beyond the flanges toward the wrist so that the pad directly contacts the wrist; said pad defining at least one marked recess or protuberance, or both, that substantially conform to detailed structure of the radial aspect of the wrist such as bony projections therefrom; and said pad spacing the casing away from and generally out of contact with the wrist.

5,068,841

MAGNETO-OPTICAL RECORDING/REPRODUCING DEVICE

Junichiro Nakayama; Hiroyuki Katayama, and Kenji Ohta, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 633,406

Claims priority, application Japan, Dec. 28, 1989, 1-342982

Int. Cl.[5] G11B *21/00, 21/02*

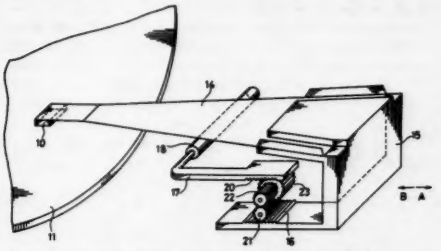
U.S. Cl. 369—13 **8 Claims**

1. A magneto-optical recording/reproducing device comprising:

a slider, having a magnetic head, that floats above a surface of a magneto-optical recording medium when the magneto-optical recording medium is in rotation;

a suspension that supports the slider, a depressing force being exerted on the slider by the suspension in a vertical direction with respect to the magneto-optical recording medium; and

adjustment means for adjusting the depressing force exerted on the slider by the suspension so that the depressing force



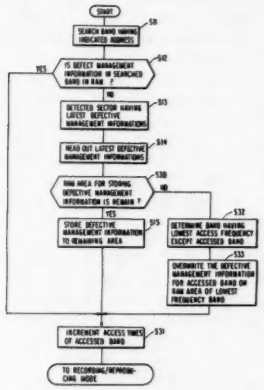
increases as the slider shifts to an outer part of the magneto-optical recording medium from an inner part.

5,068,842

CONTROL METHOD OF DISK DRIVE FOR RECORDABLE OPTICAL DISK

Ryuuich Naito, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 268,301
Claims priority, application Japan, Nov. 13, 1987, 286765
Int. Cl.[5] G11B 7/00, 27/10
U.S. Cl. 369—32 3 Claims



1. A method for controlling a disk drive for a recordable optical disk whose information storage area is divided into plurality of bands, each band comprising multiple user sectors for recording user data, multiple alternative sectors for recording said user data when said user sectors are defective, and multiple mapping sectors for recording mapping data, said control method comprising the steps of:

receiving a command to access a chosen sector of said multiple user sectors,

determining whether a memory location in a memory of said disk drive has stored therein mapping data read from a mapping sector for the band that includes said chosen sector,

reading mapping data from the most recently recorded mapping sector for said corresponding band, if said mapping data from said mapping sector has not been previously stored in said memory location, thereby accessing each band's most recently recorded mapping data only as user sectors within said band are chosen,

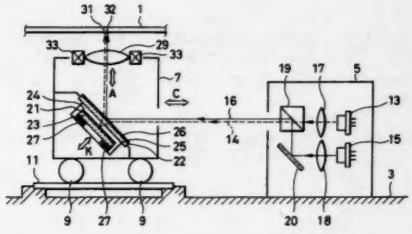
storing the mapping data read from said most recently recorded mapping sector within said disk drive at said memory location, and accessing said chosen sector or an alternate sector defined by said mapping data, depending on whether said mapping data identifies said chosen sector as having no defect or a defect, respectively.

5,068,843

OPTICAL READ-WRITE APPARATUS

Nobuo Takeshita, and Teruo Fujita, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 546,875
Claims priority, application Japan, Jul. 5, 1989, 1-173297
Int. Cl.[5] G11B 7/095
U.S. Cl. 369—44.13 17 Claims



1. An optical read-write apparatus for reading and writing information in tracks on an optical medium, comprising:

at least two beam sources for producing light beams with different wavelengths;

at least two dichroic mirrors disposed one above another in paths of said beams, each of said dichroic mirrors reflecting light of the wavelength of one of said light beams and transmitting light of other wavelengths;

piezoelectric means for tilting at least one of said dichroic mirrors; and

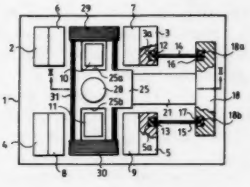
an objective lens for receiving said light beams after reflection from said dichroic mirrors and focusing them onto said optical medium.

5,068,844

OBJECTIVE LENS MOUNT UTILIZING LEAF SPRINGS

Akihiro Tanaka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,033
Claims priority, application Japan, Mar. 14, 1988, 63-59819
Int. Cl.[5] G11B 7/12
U.S. Cl. 369—44.16 7 Claims



1. A device for supporting an objective lens of an optical pickup, comprising:

a base;

at least one first leaf spring having a first end secured to a spring mounting portion of said base through an elastic member;

a connective member secured to a second end of said first leaf spring through an elastic member;

at least one second leaf spring having a first end secured to said connective member through an elastic member; and

a holder member for holding an objective lens and being

connected to a second end of said second leaf spring through an elastic member;

wherein movement of said objective lens in a tracking direction is controlled by one of said first and second leaf springs, and movement of said objective lens in a focusing direction is controlled by the other of said first and second leaf springs, and

wherein each of said elastic members is made of an elastic material having an elastic force different from that of said first leaf spring and said second leaf spring.

5,068,845

OPTICAL PICKUP DEVICE FOR READING INFORMATION ON AN OPTICAL DISK

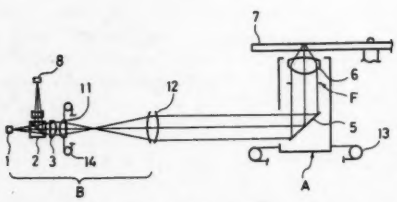
Katsuya Yagi, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,852

Claims priority, application Japan, Dec. 14, 1989, 1-322619

Int. Cl.[5] G11B *7/085*

U.S. Cl. 369—112 **3 Claims**



1. An optical pickup device for reading information stored on a disk-shaped information storage medium, which has a periphery, a center, and a radius R extending from said center to said periphery, comprising:

a fixed optical system secured to said optical pickup device, said fixed optical system including:

a light source;

a beam splitter for splitting light from said light source;

a beam deflecting lens having an optical axis and a principal point, said beam deflecting lens being positioned to receive light from said beam splitter and being movable only in a direction substantially orthogonal to said optical axis of said deflecting lens; and

a relay lens for relaying light to and from said beam deflecting lens; and

a movable optical system movable linearly in a plane parallel to said disk-shaped information storage medium along said radius R of said disk-shaped information storage medium, said movable optical system having:

a focussing object lens positioned to read said information stored on said disk-shaped storage medium; and reflecting mirror for reflecting light from said relay lens substantially perpendicularly to said focussing object lens and for reflecting light from said focussing object lens substantially perpendicularly back to said relay lens;

said focussing object lens having a focal point located at a position between said focussing object lens and said reflecting mirror;

said relay lens conjugating the position of said principal point of said beam deflecting lens with said focal point of said focussing object lens when said moving optical system is present at an intermediate position within the moving range of said movable optical system; and

an optical detector positioned to receive light from said focussing object lens after reflection by said reflecting mirror and passage through said beam splitter.

5,068,846

REFLECTIVE, OPTICAL RECORD CARRIER

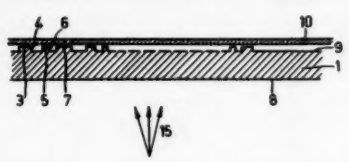
Pieter Kramer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 146,554, May 5, 1980, abandoned, which is a continuation of Ser. No. 949,919, Oct. 10, 1978, abandoned, which is a continuation of Ser. No. 772,914, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 344,867, Mar. 26, 1973, abandoned. This application Apr. 23, 1988, Ser. No. 858,550

Claims priority, application Netherlands, Sep. 2, 1972, 7211999

Int. Cl.[5] G11B *7/24*; H04N *5/85*

U.S. Cl. 369—275.1 **7 Claims**



1. A record carrier containing information which is readable by a beam of radiation, said record carrier comprising a disc-shaped, radiation-transmitting substrate having a pair of planar surfaces on opposite sides thereof, a non-transmissive, radiation reflecting optical structure on one of said planar surfaces of said substrate, said optical structure comprising a plurality of adjacent, circular tracks extending about the center of said substrate and defining turns of a spiral or concentric circles spaced from each other in the radial direction, each circular track having a plurality of depressions in said one surface of said substrate, said depressions being spaced apart in the track direction by intermediate areas, and a reflective layer extending over said intermediate areas and said depressions so that upon illumination by a convergent beam of radiation which is projected on and enters through the other of said planar surfaces and which passes through said substrate and is focussed on said optical structure to a spot of a size of the order of the smallest detail of said optical structure, the radiation is modulated by said depressions and intermediate areas in accordance with the sequence thereof and the modulated radiation is reflected by said reflective layer towards and exists through said other planar surface, said substrate defining a substantially rigid support for said optical structure and having a thickness such that in the plane of said other surface, which forms the entrance and exit faces for the radiation, the diameter of the beam is sufficiently larger than the diameter of said spot so that dust particles, scratches and the like on said other surface, do not interfere with readout of information by the convergent beam focussed to said spot on said optical structure, and an additional layer secured to the side of said substrate remote from said other surface, said optical structure being disposed between said substrate and said additional layer so that it is protected from damage during handling.

5,068,847

FIBER OPTIC NETWORK ARCHITECTURE HAVING DATA FEEDBACK FOR MONITORING COMMUNICATIONS THEREON

James C. Stout, Phoenix, Ariz., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 19, 1989, Ser. No. 423,906

Int. Cl.[5] H04J *14/00*

U.S. Cl. 359—118 **2 Claims**

1. A fiber optic network having the capability of monitoring data communications of said fiber optic network, said fiber optic network comprising:

a) optical bus means for providing an optical medium to communicate optical signals;

b) bus controller means, operatively connected to said opti-

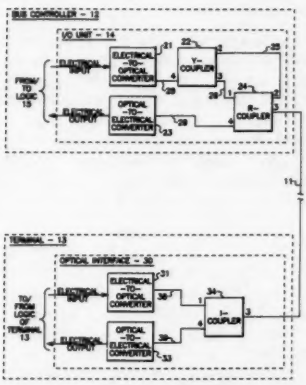
cal bus means, for controlling communications of optical information on said optical bus means, to monitor said optical information outputted on the optical bus means, thereby verifying the integrity of said optical information, and wherein said bus controller means includes,

1) controller logic means for performing the controller function in accordance with predetermined protocol requirements; and

2) optical interface means, for interfacing electrical signals of said controller logic means and optical signals of said optical bus means to provide a conversion therebetween thereby providing compatible communications between said bus controller means and said optical bus means, and further wherein said optical interface means monitors the optical information launched onto the optical bus means by said bus controller means thereby verifying the integrity of said optical information, and wherein said optical interface means includes,

i) first converter means for converting said electrical signals from said controller logic means to a first optical output signal, the first optical output signals having a power associated therewith;

ii) second converter means for converting an optical input signal to an electrical output signal, said electrical output signal being coupled to said controller logic means;



iii) first coupler means having a first and second output terminal, said first coupler means operatively connected to said first converter means, for coupling the first optical output signal to the first and second output terminals of said first coupler means, the power of the signal being delivered to the first and second output terminals of said first coupler means having a predetermined split ratio power output, such that the first output terminal outputs a second optical output signal and the second output terminal outputs a third optical output signal, the second and third optical output signals having power associated therewith corresponding to the split ratio of the first coupler means; and

iv) second coupler means having a first, second, third, and fourth terminal, the first and second output terminal of said first coupler means operatively connected to said second and first terminal of said second coupler means, respectively, the third terminal of said second coupler means operatively connected to said optical bus means, and the fourth terminal of said second coupler means operatively connected to said second converter means, for coupling said third and second optical output signals to the third and fourth terminal of said second coupler means, respectively, to output the first predetermined portion of the first optical output signal onto the optical bus means and to couple a second predetermined portion of the first optical output signal back to the controller logic means, thereby permitting the bus controller means to communicate with the terminal means coupled to the optical bus means, and providing the information communicated onto the optical bus means to the controller logical means for monitoring; and

c) at least one terminal means, operatively connected to said optical bus means, for communicating with said bus controller means.

5,068,848

MULTI-ACCESS DEVICE

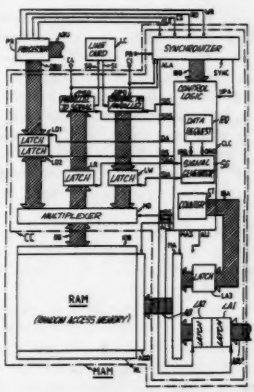
Dirk H. L. C. Rabaey, Wijnegem, and Didier R. Haspeslagh, Harelbeke, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 6, 1988, Ser. No. 280,701

Claims priority, application Belgium, Dec. 7, 1987, 8701402

Int. Cl.[5] H04J *3/02*

U.S. Cl. 370—85.6 **11 Claims**



1. Multi-access device including a common data resource to which a plurality of stations are coupled for the transmission of data, comprising:

at least one data buffer circuit;

a first data transmission circuit coupling said common data resource and a first of said stations;

at least one second data transmission circuit coupling said common data resource and said data buffer circuit;

at least one third data transmission circuit coupling said data buffer circuit and a second of said stations and used for the transmission of data thereon at predetermined moments;

first requesting means for requesting the use of said first data transmission circuit for the transmission of data thereon;

second requesting means for requesting the use of said second data transmission circuit for the transmission of data thereon; and

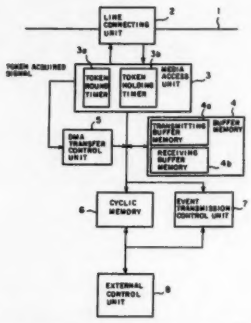
a priority circuit to which said first and second requesting means are coupled and which grants priority to requests of said first requesting means over requests of said second requesting means;

wherein said second requesting means performs a request a time interval before the next occurrence of one of said predetermined moments, said time interval having such a duration that said priority circuit is able to grant priority to said request performed by said second requesting means during said time interval.

5,068,849
CYCLIC DATA TRANSMISSION METHOD

Yasuhiro Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,321
Claims priority, application Japan, Mar. 9, 1989, 1-56709
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.5 **3 Claims**



1. A cyclic data transfer method for controlling transmission and reception of control data in a loop shaped transfer line forming a network by means of a plurality of stations which are connected to the loop shaped transfer line and to each of the stations are connected outer control devices respectively, updating a synchronous data frame queued in a transmission buffer memory with data stored in a transmission area of a cyclic memory in each of said stations, and transmitting the synchronous data frame from said buffer memory to all of said plurality of stations, said cyclic data transfer method comprising the steps of:

producing a synchronous data frame of a fixed length in each of the stations from high speed cyclic data and a prescribed portion of low speed cyclic data so as to be transmitted by acquiring a token;

sequentially loading said prescribed portion of said low speed cyclic data into the synchronous data frame so as to complete transmission of all said low speed cyclic data over several synchronous data frame transmissions; and

transmitting the synchronous frame of said fixed length into which said high speed cyclic data and said low speed cyclic data are integrated, upon the acquisition of said token.

5,068,850
PARAMETER VALUE COMMUNICATION SYSTEM

Leonard W. Moore, Northridge, Calif., assignor to Moore Industries-International, Inc., Sepulveda, Calif.

Filed Jun. 12, 1989, Ser. No. 365,168
Int. Cl.[5] H04L *5/22*
U.S. Cl. 370—85.8 **16 Claims**

1. A method of communicating analog input signal values from multiple input points over a communications link to corresponding multiple output points to become analog output signal values, said method comprising the steps of:

forming said multiple input points into input groups;

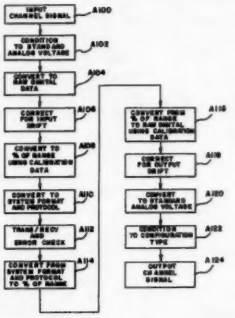
forming said multiple output points into corresponding output groups;

converting said analog input signal values to input digital values;

storing said input digital values;

generating a polling sequence in which each input group is interrogated as to its presence or operational status by generating a wake-up message comprising at least one unique digital character recognizable by an input group as a wake-up message and at least one unique digital character recognizable as the address of the selected group, and by receiving a ready message from the addressed group comprising at least one unique digital character recognizable as a ready message and at least one unique digital character recognizable as the address of the selected group;

enabling an input group to communicate with its corresponding output group during a predetermined time slot associated with the position of the input group in the polling sequence;



transmitting said stored input digital values over the communications link from an input group to its corresponding output group;

receiving said transmitted digital values over the communications link;

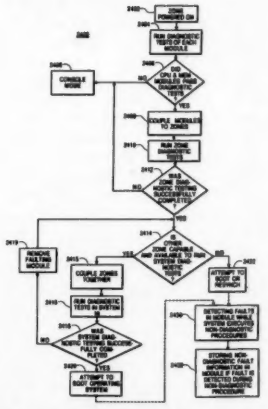
storing said received digital values; and

converting said stored received digital values to represent the analog output signal values.

5,068,851
APPARATUS AND METHOD FOR DOCUMENTING FAULTS IN COMPUTING MODULES

William Bruckert, Northboro, Mass.; Thomas D. Bissett, Derry, N.H.; David Kovalcin, Grafton, and Ravi Nene, Chelmsford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 1, 1989, Ser. No. 388,093
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.1 **16 Claims**



1. A method for testing the operation of a module for use in a data processing system, said data processing system being capable of operating in both a diagnostic mode, when only

diagnostic procedures are run to determine the presence of faults in the modules of said data processing system, and in a fully operational mode when non-diagnostic procedures are run, the method comprising the steps of:

running automated diagnostic procedures on the module when the data processing system is in the diagnostic mode to determine the presence of faults in the module;

storing diagnostic information automatically in the module if a fault is detected during the diagnostic procedures, the diagnostic information indicating that the fault detected may be field-correctable;

executing non-diagnostic procedures in the data processing system when the data processing system is in the operational mode;

detecting the presence of faults in the module automatically while the data processing system is executing non-diagnostic procedures; and

storing non-diagnostic fault information automatically in the module if a fault is detected during the non-diagnostic procedure, the non-diagnostic fault information indicating that the fault detected is not field-correctable.

5,068,852

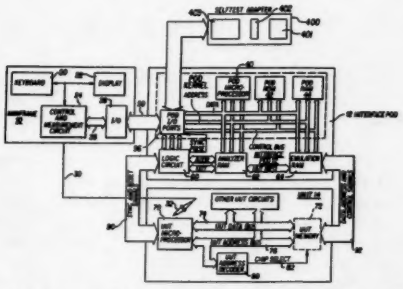
HARDWARE ENHANCEMENTS FOR IMPROVED PERFORMANCE OF MEMORY EMULATION METHOD

Thomas P. Locke, Woodinville, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation-in-part of Ser. No. 275,184, Nov. 23, 1989. This application Nov. 24, 1989, Ser. No. 441,094

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—16.2 **12 Claims**



1. An apparatus for testing, by memory emulation, a microprocessor-based unit under test (UUT) having a kernel formed by at least a microprocessor, a memory, an address bus and a data bus, said apparatus comprising:

an emulation memory connectable to said UUT in substitution for said UUT memory during testing of said UUT;

means for reading data from said emulation memory under control of said UUT microprocessor; and

a buffer circuit, comprising (a) gated data buffer means coupled to at least one data bus line at a data input of said microprocessor,

(b) gated status buffer means coupled to at least one external connection of said microprocessor for carrying a signal indicative of an operational status of said microprocessor and

(c) synchronization signal generation means responsive to said signal on said at least one external connection of said microprocessor for generating a synchronization signal for controlling acceptance of signals by both said gated data buffer means and said gated status buffer means; and

output means for reading out data stored in said buffer circuit.

5,068,853

FAIL-SAFE APPARATUS FOR IMAGE FORMING APPARATUS

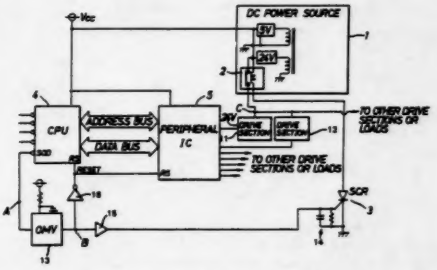
Utami Soma; Yasufumi Koseki, and Minoru Asakawa, all of Hachioji, Japan, assignors to Konica Corporations, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,317

Claims priority, application Japan, Aug. 30, 1988, 63-217143

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—16.3 **5 Claims**



1. Image forming apparatus having a fail-safe protection means, comprising:

a central processing unit for controlling an image forming operation in said image forming apparatus, said central processing unit having a normal operating state and an abnormal operating state;

an input/output controller connected to said central processing unit;

a plurality of utilization means in said image forming apparatus connected to said input/output controller for performing said image forming operation as commanded by said central processing unit;

power supply means coupled to said central processing unit, to said input/output controller, and to said plurality of utilization means;

monitoring means coupled to said central processing unit for detecting said states of operation of said central processing unit for generating a first monitor output signal when said central processing unit is operating in said normal state and a second monitor output signal when said central processing unit is operating in said abnormal state, said first and second monitor output signals being supplied to said input/output controller and to said central processing unit;

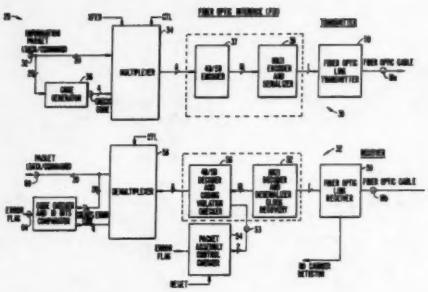
said first monitor output signal enabling said central processing unit and said input/output controller to continue to perform said image forming operation, and said second monitor output signal actuating said input/output controller to stop said image forming operation and to reset said central processing unit; and

fail-safe disconnecting means independent of said central processing unit and said input/output controller coupled between said power supply means and said monitoring means for disconnecting said power supply means from said utilization means when said monitoring means generates said second monitor output signal, whereby said fail-safe disconnecting means assures that said image forming operations are stopped even if said input/output controller malfunctions to permit said image forming process to proceed after said monitoring means generates said second monitor output signal indicating a malfunction in said central processing unit.

5,068,854
ERROR DETECTION FOR FIBER DISTRIBUTED INTERFACED OPTIC LINK

Srikumar R. Chandran; Franco E. Mau, both of San Jose, and Steven A. Jan, Santa Clara, all of Calif., assignors to Cupertino, California U.S.A., Calif.

Filed Sep. 12, 1989, Ser. No. 406,012
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.1 9 Claims



1. A method for checking for the occurrence of errors in digital data packet containing N serially transmitted bits, the N bits including two adjacent bits indicative of one of a plurality of forms of the N bits, comprising the steps of:

swapping one of the two bits with one of the remaining N bits;

creating a check code having at least one bit derived from N/M bits occupying corresponding bit positions of N/M equal-bit groups of the N bits;

serially transmitting the N bits together with the check code;

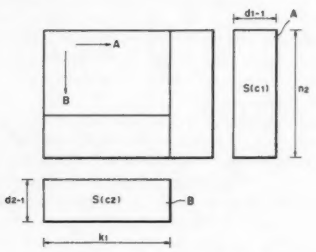
receiving the N bits and check code, and creating from the received N bits an error code in the same manner as the check code was created;

comparing the error and check codes to provide a indication of error when the error and check codes do not match.

5,068,855
ERROR CORRECTING METHOD AND APPARATUS

Motokazu Kashida, Musashino; Akihiro Shikakura, Atsugi; Shinichi Yamashita, and Tetsuya Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1989, Ser. No. 379,878
Claims priority, application Japan, Jul. 18, 1988, 63-180023; Jul. 29, 1988, 63-189803
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.4 14 Claims



1. A method of decoding digital data including error correction check codes in both of first and second directions when data is two-dimensionally arranged, comprising the steps of:

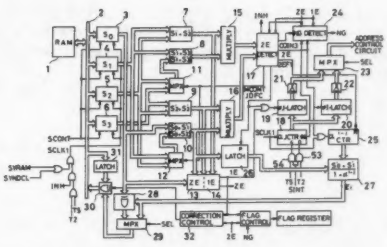
obtaining values in which the result of an arithmetic operation for error correction in at least one of said first and second directions is added to syndromes in the other direction; and

detecting and correcting an error position within said digital data again on the basis of said values.

5,068,856
METHOD AND CIRCUIT FOR DETECTING DATA ERROR

Naobumi Nagasawa, and Hiroyuki Arai, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 18, 1989, Ser. No. 339,758
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.5 7 Claims



7. A circuit for detecting a data error, comprising:

a syndrome calculating means which receives a plurality of data including parity data and calculates syndromes S_0, S_1, S_2 and S_3 and divides the syndromes S_0, S_1, S_2 and S_3 by 1, α, α^2 and α^3 (α is a root of a polynomial of degree eight) to produce outputs S_0', S_1', S_2' and S_3';

a first adding means which receives the outputs S_1' and S_2' and provides $S_1'+S_2'$;

a first selecting means which receives the outputs S_2' and S_3' and selects any one of the output S_2' and S_3';

a second adding means which receives the output S_1' and an output of the first selecting means and provides $S_1'+S_2'$ or $S_1'+S_3'$;

a third adding means which receives the outputs S_2' and S_3' and forms outputs $S_2'+S_3'$;

a second selecting means which receives the outputs S_1' and S_2' and selects any one of the outputs S_1', and S_2';

a fourth adding means which receives the output S_0' and an output of the second selecting means and forms outputs $S_0'+S_1'$ or $S_0'+S_2$;

a first multiplying means which receives outputs of the third and fourth adding means and outputs $(S_1'+S_2')^2$ or $(S_0'+S_1')(S_2'+S_3')$;

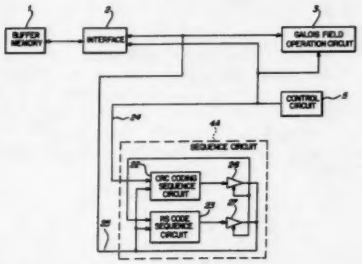
a second multiplying means which receives outputs of the third and fourth adding means and outputs $(S_0'+S_1')(S_2'+S_3')$ or $(S_0'+S_2')(S_2'+S_3')$; and

a double error detecting means which receives outputs of the first and second multiplying means and detects that one of two equations $(S_0'+S_1')(S_2'+S_3')=(S_1'+S_2')^2$ and $(S_0'+S_2')(S_2'+S_3')=(S_1'+S_2')(S_1'+S_3')$ is formed by controlling the first and second means in response to a detection output at a timing when the other of the two equations is formed.

5,068,857
ERROR CORRECTION CIRCUIT

Hideo Yoshida, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 401,968
Claims priority, application Japan, Sep. 2, 1988, 63-218262
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.7 **22 Claims**



1. An error correction circuit comprising:

a buffer memory for storing a plurality of interleaved data streams, each having as an external code an RS code for correcting an error in data and as an internal code a CRC for detecting an error in data;

an interface for untying said interleaved data streams;

a Galois field operation circuit for carrying out Galois field arithmetic operations on a syndrome of said RS code and determining an error value based on an error location for effecting correction;

an RS code sequence circuit for computing said syndrome to find an error location from results of said Galois field arithmetic operations by a Chien search;

a CRC coding sequence circuit for coding and computing said CRC, said RS code sequence circuit and said CRC coding sequence circuit being connected in parallel to together form a sequence circuit; and

a control circuit for controlling said interface, said Galois field operation circuit, said RS code sequence circuit, and said CRC coding sequence circuit and outputting a control signal for selecting either said RS code sequence circuit or said CRC coding sequence circuit for operation.

5,068,858
ERROR CORRECTION CAPABILITY VARIED WITH TRACK LOCATION ON A MAGNETIC OR OPTICAL DISK

Miguel M. Blaum, San Jose, and Hsieh T. Hao, Los Altos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

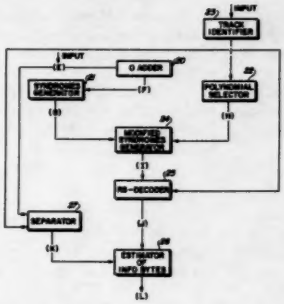
Filed Dec. 21, 1989, Ser. No. 455,197
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—41 **13 Claims**

10. A method of implementing an error-correcting code for a disk having a plurality of concentric recording areas, comprising the steps of:

selecting a Reed-Solomon code having a fixed number of data bytes and a polynomial having a full length with a number of redundant bytes that provides a preselected degree of error correction capability for the data bytes in a particular one of said concentric areas having a preselected maximum acceptable statistical error rate;

encoding a binary input string using said polynomial for progressively reducing the number of redundant bytes in each concentric area to provide a respective degree of error correction capability corresponding to a respective statistical error rate for such concentric area; and

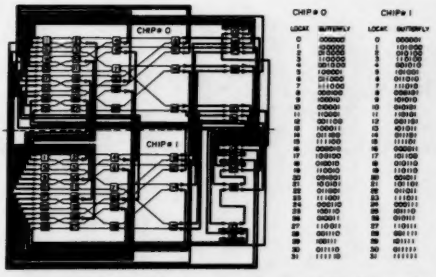
during decoding, adding a number of 0's to each encoded string that will bring said encoded string to a length corresponding to the full length of the polynomial, said added number being considered as erasures, whereby error correction capability for the respective concentric areas decreases as the number of 0's increases.



5,068,859
LARGE CONTRAINT LENGTH HIGH SPEED VITERBI DECODER BASED ON A MODULAR HIERARCHICAL DECOMPOSITION OF THE DEBRUIJN GRAPH

Oliver Collins, Key West, Fla.; Samuel J. Dolinar, Jr., Tujunga, Calif.; In-Shek Hus, Pasadena, Calif.; Fabrizio P. Bozzola, North Hollywood, Calif.; Erlend M. Olson, Azusa, Calif.; Joseph I. Statman, N. Hollywood, Calif., and George A. Zimmerman, San Pedro, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 19, 1989, Ser. No. 368,264
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—43 **47 Claims**



1. A method of partitioning a well-known deBruijn graph of arbitrary size (i.e., containing an arbitrary number of nodes 2G, where G is any positive whole integer, with such nodes being connected according to the prescribed connectivity of the deBruijn graph), wherein such method is characterized by the steps comprising:

dividing the deBruijn graph into identical internally wired modules, with provisions for additional external wires between modules as necessary to complete said connectivity of said deBruijn graph; and

formulating a Viterbi decoder, or any other suitable device having deBruijn graph connectivity, from said modules formed by said dividing step.

5,068,860

HELICAL WIGGLER DEVICE WITH PERMANENT MAGNETS FOR APPLICATION TO FREE ELECTRON LASERS

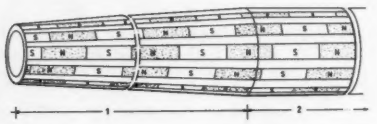
Frederic Hartemann, Cambridge, Mass.; Michel Bres, Versailles, and Roger Teillard, Beynes, both of France, assignors to Thomson Tubes Electroniques, Boulogne Billancourt, France

Continuation of Ser. No. 528,053, May 23, 1990. This application Apr. 10, 1991, Ser. No. 683,070

Claims priority, application France, May 30, 1989, 89 07082

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—2 **11 Claims**



1. A magnetic assembly for a free electron laser comprising a non-magnetic mechanical support having a longitudinal axis of symmetry,

a plurality of permanent magnets arranged on the outer surface of said mechanical support in a manner to generate a helical magnetic field centered about said longitudinal axis, the thicknesses of said permanent magnets varying in thickness along a first position of said longitudinal axis in a continuous manner and being constant in thickness along a second portion of said longitudinal axis whereby the magnetic field along said longitudinal axis varies in a adiabatic manner from zero at the start of said first portion to a maximum at the end of said first portion and remains at said maximum for the length of said second portion for fast and sharp focusing of electrons flowing along said longitudinal axis, said variation in magnetic field being a consequence only of said variation in the thicknesses of said permanent magnets without the addition of any screening material for disturbing the magnetic field produced by the permanent magnets along that might degrade the performance of the free laser under high beam current conditions of operation.

5,068,861

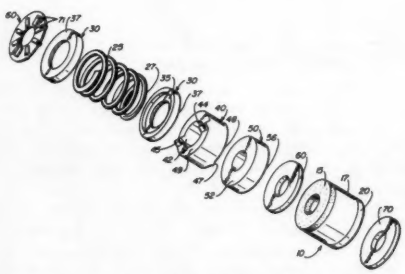
ETALON APPARATUS

Rexford J. Abbott, San Jose, and David L. Wright, Redwood City, both of Calif., assignors to Spectra-Physics Lasers, Inc., Mountain View, Calif.

Filed Jul. 19, 1990, Ser. No. 555,717

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—20 **16 Claims**



1. An improved etalon apparatus comprising:

first and second optical windows having surfaces disposed highly parallel with respect to each other;

elastic longitudinal spacer member for maintaining a distance between said first and second optical surfaces;

biasing means for applying a longitudinal load having a first transverse distribution; and

longitudinal load distribution means for receiving and redistributing the first transverse distribution of the longitudinal load applied by said biasing means and applying the longitudinal load to said elastic longitudinal spacer member in a second transverse distribution.

5,068,862

PULSED LASER

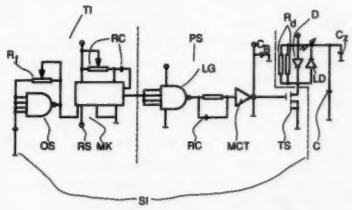
Clifton Zimmermann, Karlsruhe, Fed. Rep. of Germany, and Glen Mumford, Milford, Del., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 9, 1990, Ser. No. 520,812

Claims priority, application Fed. Rep. of Germany, May 17, 1989, 3915982

Int. Cl.[5] H01S *3/03*

U.S. Cl. 372—25 **3 Claims**



1. A pulsed laser comprising a laser diode fed by a current pulse generator including a power MOS field effect transistor, wherein said current pulse generator also includes a power stage containing a single-pole MOS clock driver driving said field effect transistor and a timing generator driving said power stage,

said field effect transistor being of the high current type and having a rise time of a few nanoseconds and said laser diode being in the circuit of a battery of capacitors.

5,068,863

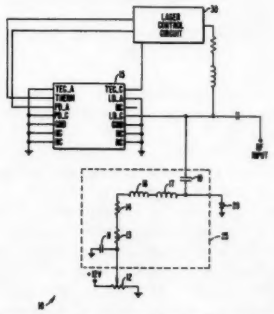
COMPENSATING CIRCUIT FOR HIGH POWER LASERS

Forrest F. Fulton, Los Altos Hills, Calif., assignor to Wavelengths Lasers, Inc., Palo Alto, Calif.

Filed Apr. 17, 1990, Ser. No. 512,296

Int. Cl.[5] H01S *3/133*

U.S. Cl. 372—31 **11 Claims**



1. In a system wherein a high frequency electrical signal is converted into a high frequency amplitude modulated optical signal, a circuit for reducing distortion which occurs during conversion, the circuit comprising:

laser means coupled to receive the electrical signal, for converting the electrical signal into an optical signal;

diode means coupled in parallel with the laser means and also being coupled to a ground potential source; and

biasing means coupled to a power supply and ground, the biasing means also being coupled to the diode means, the biasing means forward-biasing the diode means so that a portion of the electrical signal flows to the ground potential source through the diode means, the diode means and the biasing means reducing the amplitude of the electrical signal going to the laser means during one polarity of the electrical signal and increasing the amplitude of the electrical signal to the laser means during the opposite polarity.

5,068,864

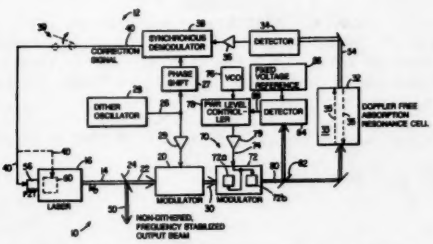
LASER FREQUENCY STABILIZATION

Ali Javan, Cambridge, Mass., assignor to Laser Science, Inc., Cambridge, Mass.

Filed May 4, 1990, Ser. No. 518,796

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—32 **17 Claims**



1. A system for stabilizing frequency fluctuations in a laser beam produced by a laser, comprising a frequency stabilization stage that includes:

A. a dither modulator external to the laser for dithering the frequency of said laser beam,

B. an absorption resonance cell having a resonance at a predetermined linewidth to which said frequency dithered beam is applied.

C. a synchronous demodulator synchronized to the dithering for producing a correction signal that represents said frequency fluctuations with respect to a reference frequency within said linewidth by demodulating an output of said cell, and

D. means for using said correction signal to correct for said frequency fluctuations and produce as an output of said stage a non-dithered beam stabilized from said frequency fluctuations, said means for using said correction signal comprising:

a modulator for generating a sideband of said laser beam, said sideband serving as said output of said stabilization stage,

a voltage controlled oscillator for applying a modulation signal to said sideband modulator, said modulation signal selected to cause said modulator to produce said sideband at a frequency shifted from a nominal frequency of said laser beam, and

means for using said correction signal to tune said voltage controlled oscillator to cause said frequency fluctuations to be stabilized in said sideband.

5,068,865

SEMICONDUCTOR LASER MODULE

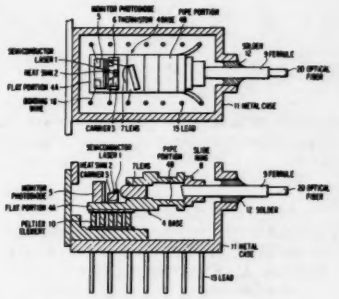
Yasunobu Ohshima, and Naoki Shibanuma, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,737

Claims priority, application Japan, Jun. 9, 1988, 63-142961; Jun. 20, 1988, 63-152763

Int. Cl.[5] H01S *3/043; G02B 6/42*

U.S. Cl. 372—36 **4 Claims**



1. A semiconductor laser module: comprising,

a semiconductor laser device from which light of a predetermined wavelength radiates, said semiconductor laser device being mounted on a chip carrier;

an optical fiber for supplying said light to a following stage, one end of said optical fiber being protected by a ferrule;

a lens for coupling said light of said semiconductor laser device to an input end of said optical fiber;

a metal base having a flat portion on which said chip carrier is mounted, and a pipe portion in the inside of which said lens is fixed on one side of said pipe portion and to which said ferrule is fixed on the other side of said pipe portion, said semiconductor laser device, said lens, and said input end of said optical fiber being aligned on an axis of said light to provide an optical system;

a metal case in which said optical system is fixed and through a side wall of which said ferrule protecting said optical fiber is passed;

a first means for detecting light; and

a second means for detecting a temperature of said semiconductor laser device;

wherein said first means is mounted on said flat portion of said metal base, and said second means is mounted on said chip carrier.

5,068,866

SEMICONDUCTOR LASER APPARATUS

Masaru Wada, Akaiwa, and Kunio Itoh, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 30, 1989, Ser. No. 428,517

Claims priority, application Japan, Oct. 28, 1988, 63-274148; Oct. 28, 1988, 63-274149

Int. Cl.[5] H01S *3/025;* H01L *23/28*

U.S. Cl. 372—36 **6 Claims**

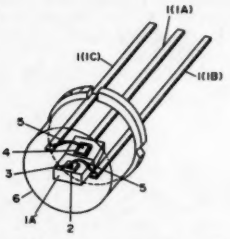
1. A semiconductor laser apparatus comprising:

a laser chip having a high reflectivity film formed on at least one end surface of a cavity thereof;

a photodiode chip;

a support member for supporting said laser chip through a mount member and for supporting said diode chip so as to receive a laser beam radiated from said laser chip in a

backward direction, said support member being an end portion of a metal lead;



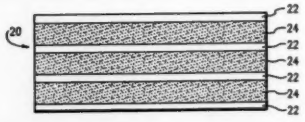
a transparent plastic resin for encapsulating said laser chip, said support member, said mount member and said photodiode chip.

5,068,867

COUPLED QUANTUM WELL STRAINED SUPERLATTICE STRUCTURE AND OPTICALLY BISTABLE SEMICONDUCTOR LASER INCORPORATING THE SAME

Thomas C. Hasenberg, Agoura Hills, and William J. Gignac, Ventura, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1989, Ser. No. 439,728
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **29 Claims**



2. A strained superlattice structure comprising:
a plurality of coupled quantum well layers; and
a barrier layer formed between each two adjacent quantum well layers respectively;
the quantum well layers having a bandgap energy which is lower than the bandgap energy of the barrier layer;
the quantum well layers having a lattice parameter which is selected to be different from the lattice parameter of the barrier layer such that a permanent strain is created in the quantum well layers and the barrier layer;
wherein the lattice parameter of the quantum well layers is higher than the lattice parameter of the barrier layer.

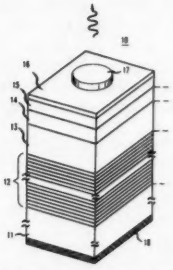
5,068,868

VERTICAL CAVITY SURFACE EMITTING LASERS WITH ELECTRICALLY CONDUCTING MIRRORS

Dennis G. Deppe, Austin, Tex.; Leonard C. Feldman, Berkeley Heights, N.J.; Rose F. Kopf, Bound Brook; Erdmann F. Schubert, New Providence, N.J.; Li Wei Tu, Westfield, N.J., and George J. Zydzik, Warren County, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 21, 1990, Ser. No. 526,204
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **20 Claims**

1. In a semiconductor vertical cavity surface emitting laser comprising at least one semiconductor selected from GaAs, GaAlAs, GaInAs, InP, InGaPAs and other related Group III–V and Group II–VI compound semiconductor, a plurality of layers including an active region which generates optical radiation and a rear mirror which reflects said radiation,
said laser further comprises
a front mirror of a metal which forms a non-alloyed ohmic contact to the semiconductor body and serves simultaneously as a front electrode of the laser, and
a rear electrode for applying, in unity with the front mirror, excitation current in direction substantially perpendicular to the active region and substantially parallel to the direction of propagation of optical radiation,



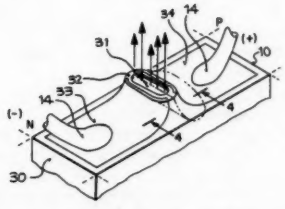
wherein said front mirror comprises a layer of highly reflective metal deposited in a thickness permitting transmission of optical radiation through the front mirror in direction perpendicular to the active region, said metal layer consisting essentially of a metal selected from the group consisting of silver and aluminum and being from 5 to 50 nm thick.

5,068,869

SURFACE-EMITTING LASER DIODE

Shing C. Wang, Mountain View, Calif.; Mutsuo Ogura, Tsukuba, Japan; Shyh Wang, El Cerrito, and Wei Hsin, Albany, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jul. 14, 1988, Ser. No. 206,386
Claims priority, application Japan, Jun. 19, 1987, 62-154213
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **12 Claims**



1. A surface-emitting laser diode comprising:
a) a semiconductor substrate made of a binary compound substantially consisting of a first element from Group III and a second element from Group V of the Periodic Table of Elements;
b) an active region formed on a surface of said substrate, said active region being generally vertical with respect to said surface of said substrate, said active region consisting of a plurality of pairs of first and second layers formed consecutively one upon the other, each first layer being made of a multinary compound substantially consisting of at least three elements all of said elements of said multinary compound being from Groups III and V of the Periodic Table of Elements, at least one of said elements of said multinary compound being from Group III and at least another one of said elements of said multinary compound being from Group V, each second layer substantially consisting of said binary compound of which said substrate is made, said active region thereby functioning as a resonant cavity;

c) a cladding structure formed on said substrate circumjacent said active region, said cladding structure consisting of a semiconductor material having a wider energy gap than said multinary compound of which said first layers of said active region are made, said cladding structure having a p-type region and an n-type region, said p-type and n-type regions being separated from each other within said cladding structure, said p-type and n-type regions being in contact with said active region to form a lateral buried heterojunction with said active region, said cladding structure thereby functioning to inject an electrical current so as to generate said laser beam and to confine said laser beam within said active region for emission in a direction substantially perpendicular to said surface of said substrate;

d) a first electrode formed on said p-type region of said cladding structure; and

e) a second electrode formed on said n-type region of said cladding structure.

5,068,870

SEMICONDUCTOR LIGHT EMISSION SYSTEM

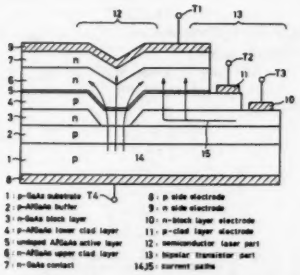
Tetsuya Yagi, and Misao Hironaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 97,457, Sep. 16, 1987. This application Nov. 13, 1990, Ser. No. 612,943

Claims priority, application Japan, Sep. 17, 1986, 61-220244

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—50 **5 Claims**



1. In a semiconductor light emission system having a semiconductor laser part including a current block layer, a first conductive clad layer, a conductive active layer, a second conductive clad layer on a conductive substrate, and a bi-polar transistor part having a collector, an emitter and a base in a position other than said semiconductor laser part, wherein the intensity of said laser part is controlled by controlling the current injected into the base.

5,068,871

PROCESS FOR SYNTHESIZING DIAMOND AND APPARATUS THEREFOR

Kiyoshi Uchida, Toyota; Shoji Noda, Aichi, and Kazuo Higuchi, Seto, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan

Filed Aug. 6, 1990, Ser. No. 563,187

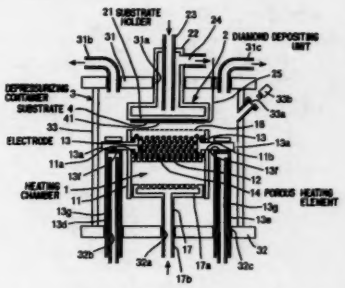
Claims priority, application Japan, Aug. 4, 1989, 1-203582

Int. Cl.[5] H01J *37/305*

U.S. Cl. 373—17 **11 Claims**

1. An apparatus for synthesizing diamond comprising:

a heating means comprising a porous heating element having a melting point or a decomposition temperature equal to or greater than 2000° C. and comprising at least one selected from the group consisting of metals and electrically conductive ceramics, at least a pair of electrodes for applying electricity to said porous heating element, an inlet port for introducing a reactant gas comprising at least a carbonaceous source gas into said porous heating element and an outlet port for delivering out an activated gas generated by heating said reactant gas with said porous heating element;



a substrate on which diamond is to be deposited disposed on the outlet port side of said heating means; and

a means for holding the substrate and for controlling a temperature of the substrate.

5,068,872

APPARATUS AND METHOD FOR SHORT CYCLING SEQUENCES OF A P-CODE GENERATOR

John C. Schroter, Waltham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 27, 1989, Ser. No. 441,855

Int. Cl.[5] G06F *1/02;* **H03B** *29/00;* **H04L** *27/30*

U.S. Cl. 375—1 **13 Claims**

1. A P-code generator of a Global Positioning System comprising:

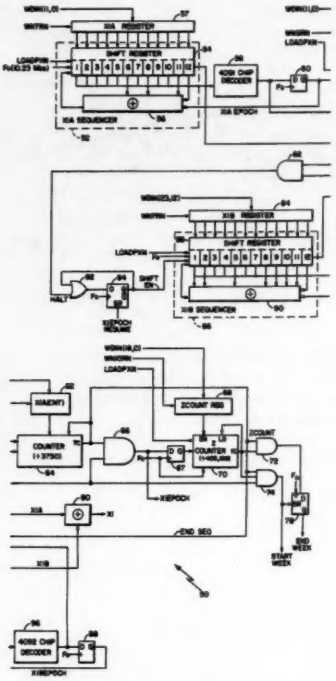
a plurality of pseudo-random number generators for generating a ranging P-code, each of said generators having a sequencer means for determining said ranging P-code;

shift register means included in each of said sequencer means comprising a plurality of stages, said shift register means having a serial input port, a serial output port, and shifting in accordance with an input signal;

decoder means coupled to each stage of said shift register means for generating a decode signal when the contents of said shift register means equals one predetermined vector word; and

means coupled to an output port of said decoder means and

to a plurality of predetermined stages of said shift register means for generating a feedback signal fed to said serial



input port of said shift register means to short cycle said sequencer means.

5,068,873

EQUALIZER

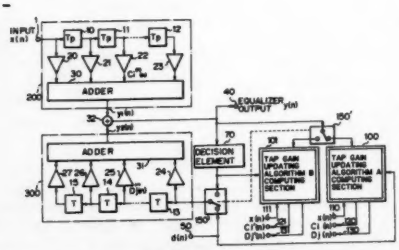
Keishi Murakami, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1990, Ser. No. 604,940

Claims priority, application Japan, Oct. 31, 1989, 1-285226; Dec. 4, 1989, 1-315862

Int. Cl.[5] H03H *21/00*; H03K *5/159*

U.S. Cl. 375—13 **3 Claims**



1. An equalizer comprising:

first and second equalizing sections each comprising a plurality of delay elements, a plurality of weight circuits and an adder to subject an input data signal to a product-sum operation a plurality of times in accordance with set tap coefficients;

a decision element which adds together output signals from said first and second equalizing sections, and makes a decision about a signal resulting from the addition;

a switch which selects either an output signal from said decision element or a reference signal which is a known signal sequence for estimation of transmission channel characteristics and inputs the selected signal to said second equalizing section;

a first computing section which receives said reference signal, an input signal to said decision element and said input data signal and makes an estimation of transmission channel characteristics in accordance with a first algorithm that has fast convergence property to set tap coefficients; and

a second computing section which receives said input data signal and signals which are inputted to and outputted from said decision element when the final reference signal in said known signal sequence and said input data signal are inputted to said first and second equalizing sections that have the tap coefficients set by said first computing section, and sets tap coefficients in accordance with a second algorithm that involves a relatively low computational complexity to update said tap coefficients.

5,068,874

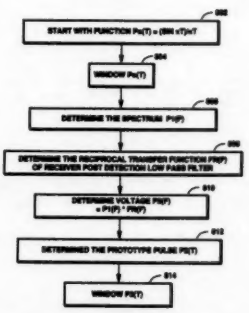
SPECTRALLY EFFICIENT DIGITAL FM MODULATION SYSTEM

Clifford D. Leitch, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 7, 1989, Ser. No. 390,317

Int. Cl.[5] H03C *1/06*

U.S. Cl. 375—51 **8 Claims**



4. A method for transmitting digital information to a communication receiver employing a post detection low pass filter having predetermined filter transfer function, said method comprising the steps of:

storing an optimized electric pulse which is derived from the processing of an electric pulse exhibiting minimum intersymbol interference characteristics with the reciprocal transfer function of the post detection low pass filter of the communication receiver, the optimized electric pulse when received and processed by the post detection low pass filter of the communication receiver providing a pulse shape exhibiting minimal intersymbol interference;

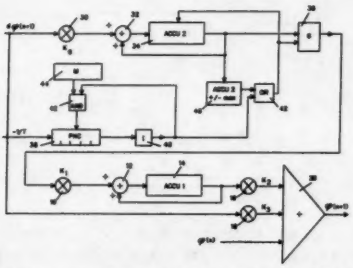
recovering the stored, optimized electric pulse in response to the digital information to be transmitted, for generating a sequence of the optimized prototype pulses corresponding thereto; and

transmitting the sequence or optimized electric pulses.

5,068,875
ADAPTIVE LOOP GAIN PHASE FILTER

Michel Quintin, La Gaude, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 1, 1989, Ser. No. 401,679
Claims priority, application European Pat. Off., Aug. 16, 1989, 89480127.3
Int. Cl.[5] H04L *25/03;* H04B *3/14*
U.S. Cl. 375—78 **6 Claims**



6. Method of compensating a phase hit in a combined amplitude-and-phase-modulation modem comprising a phase filter providing a very accurate value of the frequency shift, said method comprising the steps of:

saving the value of frequency shift last computed just prior to the occurrence of a phase hit;

detecting a phase hit;

phase rotating the received signal by a slowly incremented angle to determine the value of the phase correction for which the mean-square error presents a minimum;

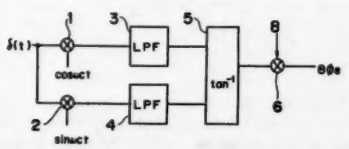
computing the phase correction during the phase rotating by using the value of the frequency shift being saved, so that said phase correction is continually determined as if no phase hit has occurred; and

adding to said continually determined value of the phase correction, the value of said slowly incremented angle for which the mean-square error presented a minimum.

5,068,876
PHASE SHIFT ANGLE DETECTOR

Shuuichi Yoshikawa, Nara; Masahiko Watanabe, Yamatokoriyama; Michio Ikeuchi, Nara; Yasumoto Murata, Tenri, and Takahiko Nakano, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 330,444
Claims priority, application Japan, Apr. 1, 1988, 63-81720
Int. Cl.[5] H03D *3/22*
U.S. Cl. 375—80 **3 Claims**



1. A phase shift angle detector for detecting a phase shift angle of a multiphase modulated signal having N-phases, N being an integer, comprising:

first multiplier means for receiving and multiplying the multiphase modulated signal by a cosine wave signal and for, upon outputting a multiplied signal to first low pass filter, producing from said first low pass filter a cosine wave signal having a phase which is representative of a sum of a phase shift ϕe and the multiphase modulated signal g(t);

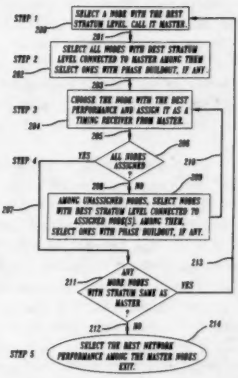
second multiplier means for receiving and multiplying the multiphase modulated signal by a sine wave signal and for, upon outputting a multiplied signal to a second low pass filter, producing from said second low pass filter a sine wave signal having a phase which is representative of a sum of a phase shift ϕe and the multiphase modulated signal g(t); and

calculation means for receiving said sine wave and cosine wave signals produced from said first and second low pass filters and for calculating an inverse tangent using the cosine wave signal and the sine wave signal and for multiplying said inverse tangent by said N to produce a signal representing the phase shift angle ϕe.

5,068,877
METHOD FOR SYNCHRONIZING INTERCONNECTED DIGITAL EQUIPMENT

Christopher D. Near, Howell, and M. Ümit Uyar, Sea Bright, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 2, 1990, Ser. No. 503,205
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—107 **5 Claims**


STEP 1
SELECT A NODE WITH THE BEST STRATUM LEVEL. CALL IT MASTER.
STEP 2
SELECT ALL NODES WITH BEST STRATUM LEVEL CONNECTED TO MASTER AMONG THEM SELECT ONES WITH PHASE BUILDOUT, IF ANY.
STEP 3
CHOOSE THE NODE WITH THE BEST PERFORMANCE AND ASSIGN IT AS A TIMING RECEIVER FROM MASTER.
STEP 4
ALL NODES ASSIGNED ?
YES
NO
AMONG UNASSIGNED NODES, SELECT NODES WITH BEST STRATUM LEVEL CONNECTED TO ASSIGNED NODE(S). AMONG THEM, SELECT ONES WITH PHASE BUILDOUT, IF ANY.
ANY MORE NODES WITH STRATUM SAME AS MASTER
YES
NO
STEP 5
SELECT THE BEST NETWORK PERFORMANCE AMONG THE MASTER NODES EXIT.

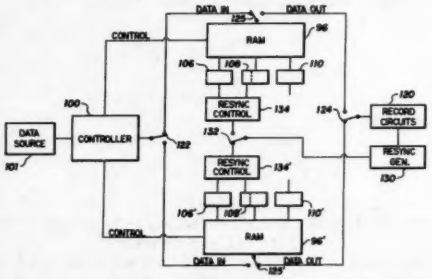
1. A method for planning synchronization clock distribution for a network of interconnected digital equipment wherein each digital equipment is represented as a node interconnected to other nodes by links, the digital equipment characterized by a set of equipment performance parameters and each link characterized by at least one link performance parameter, the method comprising assigning one node at the highest stratum level as the master clock node, forming a group of all unassigned nodes connected to the assigned node or nodes, selecting a subgroup of all nodes from the group wherein the subgroup includes all nodes having stratum levels which are equal or highest within the group, limiting the subgroup to nodes which have a desired characteristic when such nodes are included in the subgroup, determining synchronization performance of each node in the subgroup according to a predetermined criterion, assigning one node from the subgroup as a clock timing receiver wherein the one node exhibits synchronization performance better than synchronization performance for all other nodes in the subgroup, and iterating the method at the forming step until all nodes are assigned as timing receivers.

5,068,878

METHOD AND APPARATUS FOR DATA INTERLEAVE WITH PSEUDO-RANDOMIZED RESYNCHRONIZATION

Shaw-Yuch Lin, Carlsbad, and Russell D. Shon, San Diego, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,554
Int. Cl.[5] H04L *7/06;* **H04N** *5/78;* **G11B** *5/09*
U.S. Cl. 375—111 **4 Claims**



1. Apparatus for pseudo-randomly positioning resynchronization signals with respect to individual bytes of multi-byte code words initially arranged in a predetermined sequence, said apparatus comprising:

(a) means, responsive to the predetermined sequence of multi-byte code words, for temporarily storing the code words in a rearranged pattern the essence of which is the interleaving of individual bytes of different code words according to their respective positions in the initial sequence;

(b) means, coupled to said storing means, for reading out the interleaved bytes in contiguous blocks comprising a predetermined number B_1 of interleaved code word bytes; and

(c) means, responsive to said reading out means, for periodically injecting one resynchronization signal into the interleaved bytes for every B_2 bytes read out where $B_1 > B_2$, wherein at least one resynchronization signal is positioned at a variable location within each block of B_1 interleaved bytes read out, the effect of which is that each resynchronization signal is pseudo-randomly positioned to resynchronize an adjacent trailing cluster of B_2 individual bytes regardless of their respective positions within their own block of interleaved bytes and regardless of their respective positioned with the initial predetermined sequence.

5,068,879

MONITORING OF DIGITAL TRANSMISSION SYSTEMS

Brian W. Woodroffe, Edinburgh, Scotland, assignor to Hewlett Packard Company, Palo Alto, Calif.

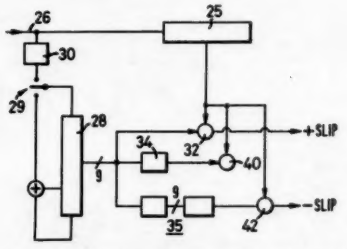
Filed Mar. 20, 1989, Ser. No. 325,628
Claims priority, application European Pat. Off., Mar. 22, 1988, 88302479.6
Int. Cl.[5] H01L *7/04*
U.S. Cl. 375—115 **5 Claims**

1. Apparatus for monitoring slip in a digital transmission system or the like that receives digital data, stores it in a memory and outputs it in synchronism with a local clock signal, the apparatus comprising:

memory means for storing receiving digital data;

first means, coupled to the memory means and responsive to the received digital data stored therein, for accumulating and storing a first group of N successive bits of a first PRBS sequence that is part of the received digital data stored in the memory means, N being an integer that is sufficiently large that N successive bits characterize the PRBS sequence, and also for producing at a first output signals indicative of the first group of N successive bits;

second means, coupled to the memory means and responsive to the received digital data stored therein, for generating a second PRBS sequence at least at one time identical to the first PRBS sequence and also for producing from the second PRBS sequence at second, third and fourth outputs, signals indicative of second, third and fourth groups of N successive bits, the second, third and fourth groups respectively indicative of a negative slip, no slip and a positive slip; and



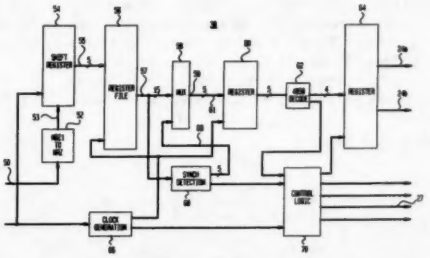
comparison means coupled to the first, second, third and fourth outputs, for comparing the first group N successive bits with each of the second, third and fourth groups of N successive bits.

5,068,880

OPTICAL INTERCONNECTS IN THE COMPUTER ENVIRONMENT

Todd A. Kline, Warminster; Warren A. Rosen, Hartsville; William J. Bermingham, Holland, and Eric A. Alfonsi, Newtown Square, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1990, Ser. No. 580,043
Int. Cl.[5] H04L *7/08*
U.S. Cl. 375—116 **13 Claims**



1. A method for decoding an input data stream formed of a plurality of received data words having a transmitted word boundary between adjacent data words and at least one synchronization word in a network interface unit of a high speed computer network, comprising the steps of:

(a) applying said input data stream to serial-two-parallel shift means to provide a plurality of parallel boundary determination words;

(b) applying said plurality of parallel boundary determination words to a plurality of synchronization word detectors wherein said synchronization word detectors provide respective synchronization word detection windows for receiving differing portions of said plurality of parallel boundary determination words to test said different portions for the presence of said synchronization word;

(c) detecting said synchronization word with the determined one of said synchronization word detection windows;

(d) determining said transmitted word boundary between said adjacent words of said input data streams in accordance with said determined synchronization word detection window.

5,068,881

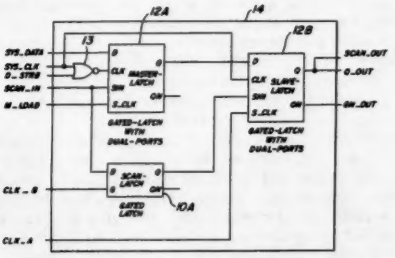
SCANNABLE REGISTER WITH DELAY TEST CAPABILITY

Bulent I. Dervisoglu, Framingham, Mass., and Gayvin E. Stong, Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 10, 1990, Ser. No. 565,345

Int. Cl.[5] G11C *5/06*; G06F *13/00*

U.S. Cl. 377—70 **26 Claims**



1. A scan-register having at least first and second data input ports, at least one data output port, and inputs for at least first, second, third, and fourth control signals, comprising:

(a) first means having inputs coupled to the first and second data input ports for selectively storing data appearing on one of the said data input ports in accordance with the occurrence of a predefined combination of states of at least the first and second control signals;

(b) second means having at least one input coupled to the second data input port for selectively storing data appearing on the second data input port in accordance with the occurrence of a predefined state of at least the third control signal; and,

(c) third means having at least one input port coupled to an output of at least one of the first and second means, and further having an output coupled to the data output port, for selectively storing data stored in one of the first and second means in accordance with the occurrence of a predefined state of at least the fourth control signal and providing the data stored therein to the data output port;

the data appearing on one of the first and second data input ports being sequentially shiftable through selected ones of the first, second and third means, to the output port in accordance with the occurrence of predefined sequences of the predefined states of at least selected ones of the control signals.

5,068,882

DUAL PARALLEL CONE BEAM CIRCULAR SCANNING TRAJECTORIES FOR REDUCED DATA INCOMPLETENESS IN THREE-DIMENSIONAL COMPUTERIZED TOMOGRAPHY

Jeffrey W. Eberhard, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

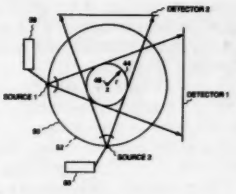
Filed Aug. 27, 1990, Ser. No. 572,590

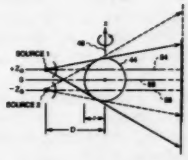
Int. Cl.[5] G01B *15/06*

U.S. Cl. 378—4 **16 Claims**

1. A scanning and data acquisition method for three-dimensional computerized tomography (CT) imaging of an object within a field of view, said method comprising;

defining a pair of circular source scanning trajectories centered on the rotation axis passing through the field of view and lying in spaced parallel planes perpendicular to the rotation axis, the source scanning trajectories being spaced a distance selected to minimize the amount of missing data; and





employing at least one cone beam x-ray source and at least one corresponding two-dimensional array detector positioned with reference to the at least one source and with reference to the field of view to scan the object at a plurality of relative angular positions along the source scanning trajectories to acquire cone beam projection data.

5,068,883

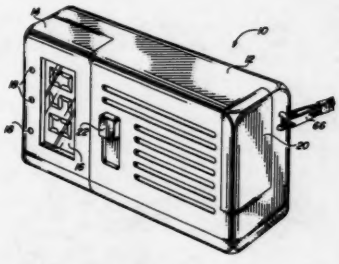
HAND-HELD CONTRABAND DETECTOR

Daniel DeHaan, San Diego, and David L. deLesdernier, Encinitas, both of Calif., assignors to Science Applications International Corporation, San Diego, Calif.

Filed May 11, 1990, Ser. No. 522,274

Int. Cl.[5] G01N *23/203*; G21F *5/012*

U.S. Cl. 378—86 **10 Claims**



1. A portable contraband detection system for detecting contraband concealed within an object, said detection system comprising:

gamma ray generating means for generating low energy gamma rays, said gamma ray generating means being located within a shielded housing having a collimator opening, said gamma ray generating means including means for generating gamma rays having a plurality of prescribed energies;

shutter means for selectively directing said low energy gamma rays through said collimator opening or into said shielded housing, said shutter means including a shutter assembly having a closed position wherein said gamma rays are absorbed into said shielded housing, and an open position wherein said gamma rays are directed through said collimator opening, said shutter assembly comprising:

a shaft passing through said shielded housing,

a drum mounted for rotation about its longitudinal axis on said shaft,

means for receiving a plurality of radioactive sources within said drum, each of said radioactive sources having a prescribed energy, each radioactive source being contained in a housing having an open end and a closed end, said closed end being held in said drum so as to be near the longitudinal axis of said drum, said open end being near a circumferencial surface of said drum,

means for selectively rotating said drum 180°, said open position corresponding to positioning said drum such that the open end of each of said radioactive source housings is the closest possible distance to said collimator opening, and said closed position corresponding to rotating said drum 180° from said open position such that the open end of each of said radioactive source housings in the farthest possible distance from said collimator opening;

gamma ray detection means for detecting backscattered gamma rays from a source external to said shielded housing;

processing means for monitoring the number of backscattered gamma rays detected by said detecting means and displaying a count signal detecting means and displaying a count signal representative thereof;

means for detecting any significant change in said count signal as said low energy gamma rays are selectively directed towards adjacent prescribed volumes of said object, the number of backscattered gamma rays noticeably changing if one of said adjacent prescribed volumes contains contraband;

whereby contraband within one of said prescribed volumes may be detected by monitoring changes in said count signal.

5,068,884

X-RAY GENERATION SYSTEM FOR AN ULTRA FINE LITHOGRAPHY AND A METHOD THEREFOR

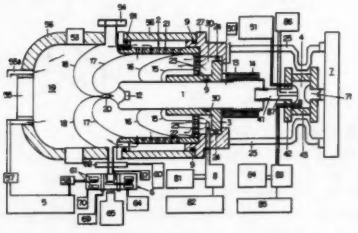
Young K. Choe; Jeon W. Yang; Jin H. Lee; Jae S. Lee, all of Daejeon-Si; Kyu H. Shim, Cheongju-Si, and Jin Y. Kang, Daejeon-Si, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Chungnam, Rep. of Korea

Filed Dec. 29, 1989, Ser. No. 459,244

Claims priority, application Rep. of Korea, Dec. 30, 1988, 88-17987

Int. Cl.[5] H01J *35/00*

U.S. Cl. 378—119 **11 Claims**



1. A soft X-ray generator system for an ultra fine lithography comprising:

a length adjustable center electrode having an adjusting screw and a tightening screw for adjusting the length of said center electrode;

a cylindrical peripheral electrode surrounding said ceer electrode and having a plurality of gas flow apertures or electrode bars for generating a soft X-ray from an ionized gas at a high temperature;

a transparent observation cylinder attached to said peripheral electrode of observing the X-ray generator system from the outside of said cylindrical peripheral electrode;

a discharging member or exposure connected to said cylindrical peripheral electrode for perpendicularly discharging said center electrode;

a plurality of vacuum sealing rubber rings disposed between said center and said cylindrical peripheral electrodes having Be discharge and observation windows for maintaining vacuum of a vacuum chamber, wherein said observation windows observe and measure three dimensionally;

a cylindrical insulator surrounding said center electrode having a base;

a metal container connected to said peripheral electrode having a tip of said center electrode extending to exhaust holes of a semi-circular, a circular, or an oval observation cylinder, wherein said exhaust holes are provided symmetrically and axially in a circular arrangement at opposite sides of insulators and an exhaust pump;

a pair of spatial gap switching metal electrodes having a large electric power and a capacitor connected to said center electrode respectively,

circular current returning wires having a diameter of a circular connecting each of said returning wires at a minimum when said current returning wires pass between two electrodes of a switch discharge chamber;

a separate electric power source connected to said discharge member for removing contamination between a center cylinder and said peripheral electrode;

a metal disc having a plurality of apertures disposed between a discharge chamber and said cylindrical insulator; and

gas feeding members connected to said discharge chamber for feeding the ionized gas to said discharge chamber.

5,068,885

ROTARY-ANODE X-RAY TUBE COMPRISING A HELICAL-GROOVE SLEEVE BEARING AND LUBRICANT RESERVOIR WITH CONNECTING DUCT SYSTEM

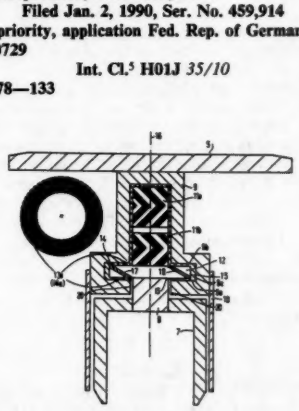
Axel Vetter, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 2, 1990, Ser. No. 459,914

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1989, 3900729

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—133 **13 Claims**



9. A rotary anode x-ray tube having

an x-ray tube housing in which a vacuum is maintained,

a rotary anode within said housing and rotatable about an axis of rotation, and

axial bearing means for axially supporting said anode in an axial direction during anode rotation, said axial bearing means comprising two bearing surfaces rotatable with respect to each other about said axis of rotation, and a lubricant between said bearing surfaces communicating with the vacuum within said housing, the improvement comprising:

a lubricant reservoir containing lubricant and communicat-

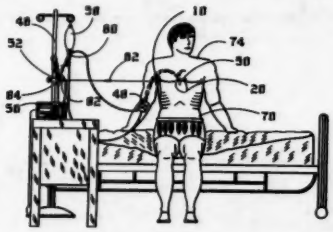
ing with said lubricant between said bearing surfaces for replenishing lubricant lost from between said bearing surfaces, and pressure equalization means for connecting said reservoir to the vacuum of said housing and equalizing the reservoir lubricant pressure with said vacuum.

5,068,886

CATHETER OR CANNULA POSITION INDICATOR FOR USE IN HEMODYNAMIC MONITORING AND THE LIKE

Monica Lavia, 3524 Hickory, Omaha, Nebr. 68105

Filed Jun. 28, 1990, Ser. No. 544,968
Int. Cl.[5] H05G *1/28*
U.S. Cl. 378—164 **11 Claims**



11. A method of determining the relative location of a radio opaque catheter inserted into an area to e catheterized, said locating method comprising the steps of:

placing a radio transparent sheet material containing a plurality of spaced apart radio opaque material fastener portions over the area to be catheterized;

producing an X-ray film of said area to be catheterized; and

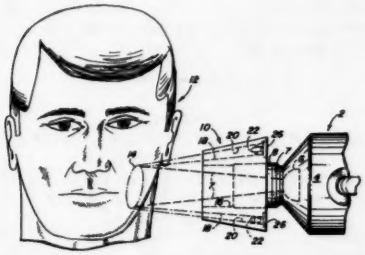
determining he relative location of said catheter in relation to any of said spaced apart radio opaque fastener portions of said radio transparent sheet material from said X-ray film.

5,068,887

DENTAL X-RAY ALIGNMENT DEVICE

John R. Hughes, 4140 E. La Paloma Dr., Tucson, Ariz. 85718

Filed Nov. 26, 1990, Ser. No. 618,080
Int. Cl.[5] G03B *42/02*
U.S. Cl. 378—170 **22 Claims**



1. An alignment device for attachment to the extension tube of a dental x-ray unit to align the extension tube through which a pattern of x-rays is emitted to a patient's jaw, the device comprising:

a cylinder adapted to operably attach to the extension tube, said cylinder having a front face and a rear face; and

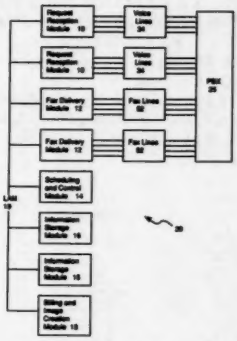
means operably attached to said cylinder to project a circle of light to the patient's jaw in alignment with the x-ray pattern emitted from the extension tube, said means including a first cylindrical surface formed in said cylinder, a second cylindrical surface also formed in said cylinder, said first cylindrical surface concentric to said second cylindrical surface, and a first radially directed annularly shaped base joining said first and second cylindrical surface, said first and second cylindrical surface and said first base defining a first annularly shaped cavity with an open circular front situated at the front face of said cylinder.

5,068,888

INTERACTIVE FACSIMILE INFORMATION RETRIEVAL SYSTEM AND METHOD

Randall P. Scherk, and Daniel J. Steneker, both of Richmond, Canada, assignors to AFD Systems, Inc., Richmond, Canada

Filed Aug. 11, 1989, Ser. No. 393,482
Int. Cl.[5] H04M *11/00*; H04N *1/32*
U.S. Cl. 379—100 **24 Claims**



1. A document delivery system for delivering recorded documents from an information storage location to specified user facsimile machines positioned at remote locations, the information delivery system comprising:

memory means for storing a multiplicity of documents;

request processing means for receiving requests for specific documents stored within said memory means, said request processing means including prompting means for providing signals to a user to prompt the user to specify order information denoting one or more selected documents and a designated telephone number for the user's facsimile machine; said prompting means including,

a plurality of voice lines each capable of connecting the request processing means to a user on an incoming telephone line, each said voice line having an associated speech generator for generating voice messages prompting a user to provide order information, and

a request controller coupled to said voice generator means and said voice lines for directing the generation and delivery of voice messages to said voice lines to prompt the users to provide order information, to echo back to said users said order information, and to prompt users to correct said order information when said order information is erroneous; said request processing means including means for assigning each document request a priority value;

facsimile delivery means for automatically delivering selected documents to a facsimile machine at said designated telephone number, said facsimile delivery means including at least one facsimile delivery module having:

a plurality of independent facsimile lines each capable of transmitting selected documents to a remote facsimile machine, said facsimile lines being capable of simultaneously delivering independent documents to different remote facsimile machines; and

facsimile control means for receiving the order information and for directing a particular facsimile line to deliver the selected documents to the designated tele-

phone number, wherein said facsimile control means includes means for receiving order information for a plurality of independent orders and for coordinating the simultaneous delivery of selected documents to different designated numbers; and

control means, coupled to said request processing means and said plurality of facsimile delivery means, for restricting and restraining access by said users to said documents stored in said memory means in accordance with specified criteria, and for scheduling and controlling delivery of requested documents via said facsimile delivery means in accordance with priority values assigned to said document requests.

5,068,889

CORDLESS TELEPHONE CAPABLE OF PROGRAMMING AN ID CODE INTO BOTH A BASE AND CORDLESS REMOTE UNIT VIA THE CORDLESS REMOTE UNIT

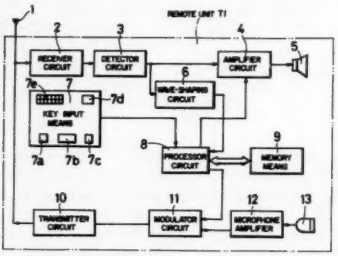
Kouji Yamashita, Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1989, Ser. No. 448,838

Claims priority, application Japan, Dec. 12, 1988, 63-314476

Int. Cl.[5] H04M *1/56, 11/00*

U.S. Cl. 379—62 **7 Claims**



1. A cordless telephone for transmitting and receiving telephone calls including a base unit and a remote unit capable of communicating with each other through radio transmission, where both the base unit and the remote unit include a programmable ID code which is transmitted when the remote unit desires radio transmission of an outgoing telephone call via the base unit or the base unit desires radio transmission of an incoming telephone call to the remote unit whereupon communication of incoming and outgoing telephone calls through radio transmission, between both units, is established only when the ID code of a remote unit is identical to the ID code of the base unit, the remote unit further including,

storage means for storing said programmable ID code, and

input means, operatively connected to said storage means and including a programming key, numerical keys and an ID key, for inputting said ID code into said storage means upon activating said programming key and said ID key and numerical keys corresponding to the ID code, and for subsequently outputting a radio transmission to the base unit, including the ID code;

the base unit including,

detecting means for receiving said output radio transmission, including said ID code, and for detecting activation of said programming key and ID key,

control means, operatively connected to said detecting means, for outputting a first write signal, followed by said ID code, in response to said detecting means detecting activation of said programming key and said ID key, and

non-volatile memory means, operatively connected to said control means and capable of accessing and storing data, for, upon receiving said output first write signal, storing said ID code in a first memory area.

5,068,890

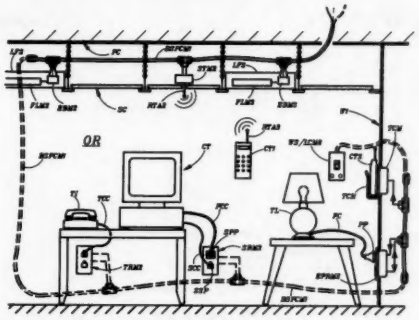
COMBINED SIGNAL AND ELECTRICAL POWER DISTRIBUTION SYSTEM

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 397,266, Aug. 23, 1989, which is a continuation-in-part of Ser. No. 136,505, Dec. 23, 1987, Pat. No. 4,866,757, which is a continuation of Ser. No. 921,381, Oct. 22, 1986, abandoned. This application Aug. 6, 1990, Ser. No. 562,897

Int. Cl.[5] H04M *11/00;* **H01B** *7/00;* **H04Q** *7/04*

U.S. Cl. 379—90 **60 Claims**



1. A combined signal and electric power distribution system comprising:

a signal and power distribution center connected with the signal transmission lines of a telephone utility company as well as with the electric power lines of an electric utility company;

a combined signal and power conducting means connected with the signal and power distribution center, and thereby also with said signal transmission lines and electric power lines; the combined signal and power conducting means including a set of signal conductor means as well as a set of main power conductor means; the combined signal and power conducting means being operative to permit, at each of plural connection-points disposed at spaced-apart locations therealong, access operative via a connect means to provide for connection with said signal transmission lines and/or said electric power lines; and

plural signal and/or power utilization means, each having a connect means by which it is connected with said combined signal and power conducting means at one of said connection-points.

5,068,891

CREDIT CONTROL SYSTEM FOR LONG DISTANCE TELEPHONE SERVICES

Marvin Marshall, 13014 N. Dale Mabry, Tampa, Fla. 33618

Filed May 31, 1989, Ser. No. 359,200

Int. Cl.[5] H04M *17/02*

U.S. Cl. 379—91 **15 Claims**

1. A method for preventing telephone travel card abuse, comprising the steps of:

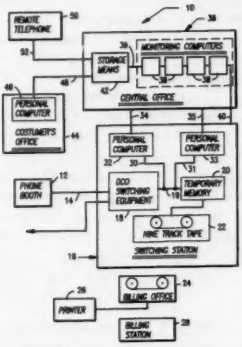
capturing data transmitted by a conventional, pre-existing switching equipment means, including information concerning the temporal length of a long distance telephone call, immediately upon completion of the call;

said step of capturing data including the step of capturing said data as it is transmitted between a switching equipment means and an internal buffer means;

immediately transmitting the captured data to a monitoring means;

immediately subtracting the temporal length of the call from

the amount of time available to the caller as determined by the caller's line of credit; and



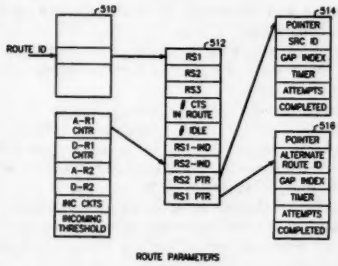
immediately invalidating the caller's travel card account number if no amount of time is available to the caller after said subtraction.

5,068,892

ROUTE BASED NETWORK MANAGEMENT

Konstantin Livanos, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1989, Ser. No. 429,662
Int. Cl.[5] H04M *7/00*
U.S. Cl. 379—221 **16 Claims**



1. In a telecommunications system comprising a plurality of interconnected exchanges the method of controlling traffic on a route, which includes all interconnecting circuits between a first exchange and any one other exchange, comprising the steps of:

collecting separate traffic activity data for each of a plurality of types of traffic, said plurality comprising direct routed outgoing traffic, alternate routed outgoing traffic, and incoming traffic, for a route;

comparing said traffic activity data with predetermined control criteria distinctive to each of said traffic types; and

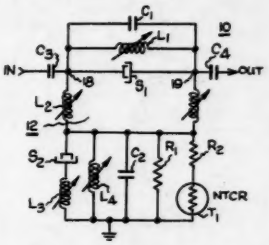
selectively applying traffic controls to limit the traffic on said route only in a selected one or selected ones of said type or types of traffic which meet said predetermined control criteria.

5,068,893

TELEVISION SIGNAL PROCESSING NETWORK FOR SUBSCRIPTION TELEVISION JAMMING SIGNALS

Lamar E. West, Maysville; William P. Lafay, Snellville; Majid Ghanouni, Marietta, and Alex M. Cook, Jr., Lawrenceville, all of Ga., assignors to Scientific Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 926,749, Nov. 4, 1986, Pat. No. 4,748,667. This application May 9, 1988, Ser. No. 192,062
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] H04N *7/167;* H04K *3/00;* H03H *9/00*
U.S. Cl. 380—7 **18 Claims**



1. A network for removing from a television signal, such as is distributed to CATV subscribers, a jamming signal combined with the television signal, the television signal having a picture carrier which can be located over a broad band television signal transmission range, which network comprises means including a surface acoustic wave (SAW) device having a frequency response which shifts with temperature and including a temperature compensation means, said device and said compensating means cooperatively providing a substantially constant frequency response with variations in temperature of said network with an insertion loss over a narrowband, much narrower than the broad band of said television signal, said narrow band insertion loss being within a range about 40 KHz, which, at the frequency of the jamming signal, is at least about 100 times greater than the insertion loss at the frequency of said picture carrier and is approximately at least 36 dB below the insertion loss at the picture carrier, and which insertion loss is greater than about 36 dB over a frequency range extending above and below the frequency of said jamming signal a sufficient range to accommodate said shifts in the frequency response of said device with respect to the frequency of said jamming signal, and said network further comprised means connected to said device for providing a total insertion loss over said broad band range of said network including said device of less than about 1 dB except over a frequency range of about ± 24 MHz with respect to the frequency of said jamming signal where said loss is less than about 3 dB.

5,068,894

METHOD OF GENERATING A UNIQUE NUMBER FOR A SMART CARD AND ITS USE FOR THE COOPERATION OF THE CARD WITH A HOST SYSTEM

Joseph Hoppe, Les Molieres, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Aug. 22, 1990, Ser. No. 571,051
Claims priority, application France, Aug. 22, 1989, 89-11113
Int. Cl.[5] H04L *9/32;* G07F *7/08;* H03B *29/00;* G06F *1/02*
U.S. Cl. 380—23 **14 Claims**

12. A system for validating access to a smart card via a reader, comprising within said card:

storage means for storing a production key PK, a distributor key MK, a serial number NS, and a bearer code CP, for comparison with a bearer code CP presented by a bearer;

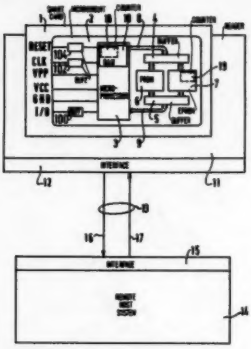
a counter for containing a count CTRAM;

input message generating means responsive to said storage means and said counter for therefrom juxtaposing said

serial number NS and said count CTRAM to generate an input message ME;

key generating means fed by said storage means for modulo-2 adding said production key PK and said distributor key MK to form a key KAC;

encryption means responsive to said input message generating means and said key generating means for forming a pseudo-random unique number NU by encrypting said input message ME utilizing said key KAC; and



incrementing means for, upon each formation of the number NU, incrementing the count CTRAM of said counter;

means for enabling said reader to read the unique number NU formed; and

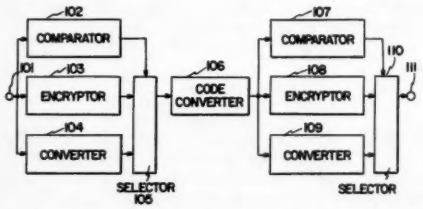
means for determining whether a response applied to the card by the reader has been correctly calculated in accordance with a predetermined function of the unique number NU.

5,068,895

ENCRYPTION AND DECRYPTION METHODS USING BIT-LENGTH PRESERVATION DECRYPTOR

Michio Shimada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1989, Ser. No. 343,338
Claims priority, application Japan, Apr. 28, 1988, 63-108643
Int. Cl.[5] H04L *9/28*
U.S. Cl. 380—28 **10 Claims**



1. An encrypting method for producing a code associated with input information, comprising the steps of:

(a) if a numerical representation of said input information is smaller than a predetermined numerical value, applying a first predetermined operation to said input information to produce a first result of said predetermined operation and after said first result of said first predetermined operation is divided by said predetermined numerical value, producing a first residual as an interim result;

(b) if said numerical representation of said input information is not smaller than said predetermined numerical value, applying a first predetermined conversion to said input information and producing a result of said first predetermined conversion as said interim result;

(c) applying a predetermined code conversion to said interim result and producing a result of said predetermined code conversion as a new interim result;

(d) if said new interim result is smaller than said predetermined numerical value, applying a second predetermined operation to said new interim result to produce a second result of said second predetermined operation and, after said second result of said second predetermined operation is divided by said numerical value, producing a second residual as said code; and

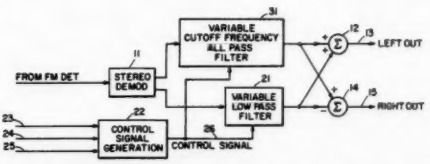
(e) if said new interim result is not smaller than said predetermined numerical value, applying a second predetermined conversion to said new interim result and producing a result of said second predetermined conversion as said code.

5,068,896

AUDIBLE NOISE REDUCING

William R. Short, Ashland, Mass., assignor to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 405,359, Sep. 11, 1989. This application Sep. 18, 1990, Ser. No. 584,521
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—13 **31 Claims**



1. Apparatus for reducing audible noise in a stereo receiver comprising,

a stereo demodulator having a monophonic signal output and a difference signal output,

a left signal combiner and a right signal combiner,

a variable cutoff frequency filter with a control signal input and having a controllable variable cutoff frequency intercoupling said difference signal output with the left and right combiners,

a control signal generator having a control signal output coupled to the control signal input of the variable cutoff frequency filter

said control signal generator having at least one of an rf level input and a multipath level input and producing a bandwidth-reducing control signal on said control signal output when a signal on said at least one input indicates the rf signal then being received by said stereo receiver produces high frequency noise at said difference signal output to then reduce the bandwidth of said variable cutoff frequency filter and reduce the high frequency noise signal therefrom.

5,068,897

MOBILE ACOUSTIC REPRODUCING APPARATUS

Toshitaka Yamato; Tatsuo Ito; Atsuyuki Takashima, all of Kobe, and Akira Motojima, Akashi, all of Japan, assignors to Fujitsu Ten Limited, Hyogo, Japan

Filed Apr. 26, 1990, Ser. No. 514,833
Claims priority, application Japan, Apr. 26, 1989, 1-108211
Int. Cl.[5] H04R *5/02*
U.S. Cl. 381—24 **4 Claims**

1. A mobile acoustic reproducing apparatus comprising:

right and left loudspeakers disposed at positions at mutually different directional angles at the front right and front left positions of the listener,

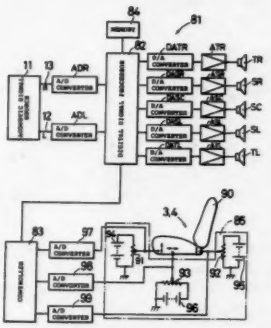
a center loudspeaker positioned near the middle between the

right and left loudspeakers, and disposed at a position of a directional angle larger than one of the right and left loudspeakers and smaller than the other one of the right and left loudspeakers,

an acoustic signal source for delivering an acoustic signal of a left channel to the left loudspeaker and an acoustic signal of a right channel to the right loudspeaker,

means for correcting the right channel and left channel acoustic signals by phase and level, and providing corresponding right and left correction signals,

means for adding the acoustic signals of the right and left channels, correcting the level thereof, and providing corresponding center correction signals,



means for adding the right and left correction signals and the center correction signal, and correcting the phase to feed to the center loudspeaker,

right and left tweeters disposed at the front right and front left sides of the listener and at a position of a larger directional angle than the directional angles of the right and left loudspeakers,

right and left high pass filters for filtering signals over a predetermined frequency of the acoustic signals of the right and left channels, and feeding corresponding filtered signals to the right and left tweeters, and

right and left level adjusting means for adjusting the level ratio of acoustic signal levels supplied to the right and left tweeters and acoustic signal levels supplied to the right, left and center loudspeakers.

5,068,898

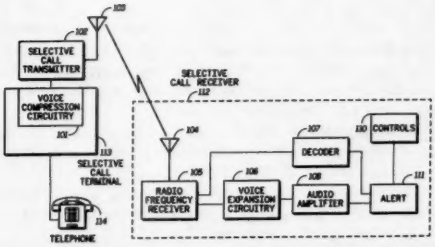
VOICE MESSAGING METHOD FOR SELECTIVE CALL RECEIVERS

James W. Dejmek, Lombard, Ill., and Ronald A. Craig, Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1989, Ser. No. 456,430

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—29 **22 Claims**



1. A method comprising the steps of:

(a) time-compressing a voice message; and

(b) translating the frequency spectrum of said voice message.

5,068,899

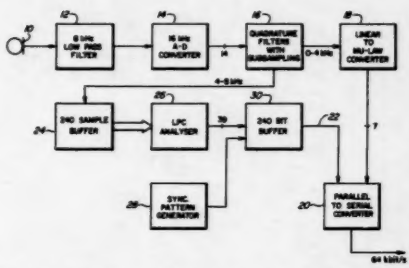
TRANSMISSION OF WIDEBAND SPEECH SIGNALS

John G. Ellis, and Bruce L. Townsend, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 8, 1985, Ser. No. 721,091

Int. Cl.[5] G10L *3/02*; H04J *3/12*; H04B *1/66*

U.S. Cl. 381—31 **17 Claims**



1. A method of transmitting components of a signal in a high band of frequencies, above a predetermined frequency, on a digital transmission channel which carries components of the signal in a low band of frequencies, below the predetermined frequency, in the form of signal samples sampled at a rate of twice the predetermined frequency, comprising the steps of:

deriving from the signal bits of information relating to the high band signal components; and

transmitting said bits of information in place of the least significant bit of the samples.

5,068,900

VOICE RECOGNITION SYSTEM

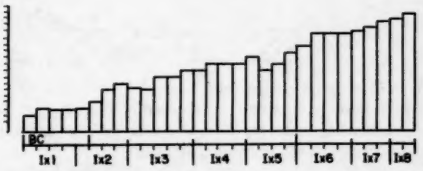
Gus Searcy, 17059 El Cajon Ave., Yorba Linda, Calif. 92686, and Franz Kavan, 211 S. Western Ave. No. 25, Anaheim, Calif. 92804

Continuation of Ser. No. 642,299, Aug. 20, 1984, Pat. No. 5,063,603. This application Jul. 16, 1990, Ser. No. 552,561

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—43 **1 Claim**



1. A speech recognition system comprising:

an audio sensing circuit conformed to provide a sequence of pulses each of a length corresponding to the length of an audio wave;

buffer memory means conformed to receive and store a sequence of count codes each corresponding to the length of a respective one of said pulses;

segmenting means conformed to receive the count codes in said buffer memory means for accumulating the count codes therein and dividing said accumulation by a predetermined integer divisor and for producing a segment period indicative of said division;

sorting means operatively connected to receive said count codes from said buffer memory means and conformed to

sort said count codes into preselected class intervals of count groups; and

said sorting means further including distributing means for distributing said count codes in accordance with said segment periods.

5,068,901

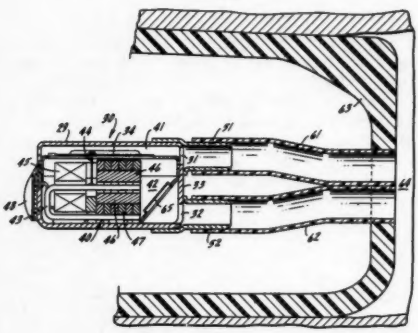
DUAL OUTLET PASSAGE HEARING AID TRANSDUCER

Elmer V. Carlson, Prospect Heights, Ill., assignor to Knowles Electronics, Inc., Itasca, Ill.

Filed May 1, 1990, Ser. No. 517,569

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—68.6 **14 Claims**



1. A hearing aid comprising:

a main housing, insertable into the ear of a hearing aid user, the housing including a sound outlet wall that faces into the ear canal of the hearing aid user;

a receiver housing mounted within the main housing in spaced relation to the sound outlet wall;

diaphragm means, mounted within the receiver housing, defining first and second acoustic chambers in the receiver housing;

an electromagnetic motor, mounted in the receiver housing, mechanically connected to the diaphragm to move the diaphragm, at frequencies within a given audio range, in accordance with an electrical signal applied to the motor;

first and second outlet ports, through the receiver housing, one connected each chamber;

and first and second elongated sound transmission tubes, one for each outlet port, each tube connecting its outlet port through the sound outlet wall of the main housing into the user's ear canal independently of the other tube.

5,068,902

METHOD AND APPARATUS FOR REDUCING ACOUSTICAL DISTORTION

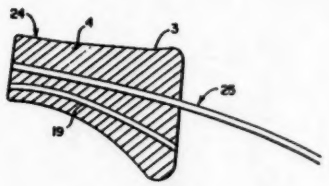
Gary L. Ward, Roanoke, Va., assignor to Epic Corporation, Hardy, Va.

Division of Ser. No. 932,812, Nov. 19, 1986, Pat. No. 4,811,402, which is a continuation-in-part of Ser. No. 930,778, Nov. 13, 1986, abandoned. This application Mar. 6, 1989, Ser. No. 318,832

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[5] H04R *25/00, 25/02;* A61B *7/02*

U.S. Cl. 381—68.6 **36 Claims**



20. A method for reducing distortion of an acoustical waveform conveyed in a conduit, said method comprising forming said conduit from a composite comprising a plurality of microspheres and a polymeric matrix.

5,068,903

METHOD OF AND ARRANGEMENT FOR LINEARIZING THE FREQUENCY RESPONSE OF A LOUDSPEAKER SYSTEM

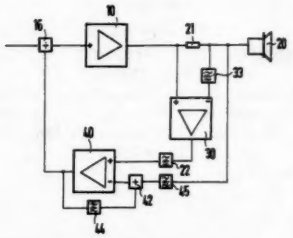
Michael Walker, Baltmannsweiler, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Oct. 27, 1989, Ser. No. 427,828

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1988, 3836745

Int. Cl.[5] H04R *3/00*

U.S. Cl. 381—96 **3 Claims**



1. Arrangement for improving the frequency response of a loudspeaker system comprising:

a power amplifier driving the loudspeaker system,

a current-sensing resistor for inter-connecting the power amplifier and the loudspeaker system,

a first operational amplifier responsive to a first voltage developed across the current-sensing resistor to produce a second voltage derived therefrom,

a second operational amplifier responsive to a difference between a third voltage applied to the loudspeaker system and the second voltage, and

a high-press filter between the output of the first operational amplifier and the noninverting input of the second operational amplifier.

5,068,904

IMAGE MEMORY CIRCUIT FOR USE IN A ROTATION OF IMAGE DATA

Hitoshi Yamazaki, Oume, Japan, assignor to Casio Electronics Manufacturing and Casio Computer Co. Ltd., both of Tokyo, Japan

Continuation of Ser. No. 348,136, May 5, 1989, abandoned, which is a continuation of Ser. No. 41,871, Apr. 21, 1987, abandoned. This application Sep. 28, 1990, Ser. No. 590,532
Claims priority, application Japan, Apr. 23, 1986, 61-93588; Apr. 23, 1986, 61-93589; Apr. 23, 1986, 61-93590
Int. Cl.[5] G06K *9/32*
U.S. Cl. 382—46 6 Claims

Y1	Y0	W3	W2	W1	W0	H/V = 1 ROTATION DURING READ	H/V = 0 ROTATION DURING WRITE
0	0	0	0	BASIC IMAGE NOT TURNED		BASIC IMAGE NOT TURNED	
1	0	0	0	UP-SIDE-DOWN AND BACK-TO-FRONT		UP-SIDE-DOWN AND BACK-TO-FRONT	
0	1	0	0	———		———	
1	1	0	0	———		———	
0	0	1	0	———		———	
1	0	1	0	———		———	
0	1	1	0	REVERSED FROM LEFT TO RIGHT AND VICE VERSA AND BACK-TO-FRONT		REVERSED FROM LEFT TO RIGHT AND VICE VERSA AND BACK-TO-FRONT	
1	1	1	0	ROTATED BY 180°		ROTATED BY 180°	
0	0	0	1	ROTATED BY 90° CLOCKWISE		ROTATED BY 90° ANTI CLOCKWISE	
1	0	0	1	UP-SIDE-DOWN, BACK-TO-FRONT AND ROTATED BY 90° CLOCKWISE		UP-SIDE-DOWN, BACK-TO-FRONT AND ROTATED BY 90° ANTI CLOCKWISE	
0	1	0	1	———		———	
1	1	0	1	———		———	
0	0	1	1	———		———	
1	0	1	1	———		———	
0	1	1	1	REVERSED FROM LEFT TO RIGHT, BACK-TO-FRONT, ROTATED BY 90° CLOCKWISE		REVERSED FROM LEFT TO RIGHT, BACK-TO-FRONT, ROTATED BY 90° ANTI CLOCKWISE	
1	1	1	1	ROTATED BY 270° CLOCKWISE		ROTATED BY 270° ANTI CLOCKWISE	

1. A memory control circuit of an image memory, which is a two dimensional memory addressed by one-word unit in an X direction and by one-bit unit in a Y direction, for reading/writing one word data comprising m bits from/to a memory region designated by a single address at a time, said circuit comprising:

a) x address designating means (XA4–XA11) for designating said X direction address;

b) y address designating means (YA0–YA11) for designating said Y direction address;

c) conversion designating means (H/V) for designating an existence or nonexistence of a rotating conversion of the data read to or written from said image memory;

d) word address converting means (SL1, SL2, EORG2) being inputted by both one-word unit addresses designated by said X address designating means and Y address designating means, for outputting them "as is" or by exchanging their addresses, as one-word unit internal address of said memory;

e) m memory sections (M_0–M_{15}), each being an aggregate of the memory cells at the same bit position in the word section of said image memory, and respectfully having a one-bit data input/output line;

f) bit address converting means (EORG1, ADRR) for applying Y direction addresses (YK0–YK3) in one-bit units designated by said Y address designating means to said M memory sections (M_0–M_{15}) commonly "as is", or by converting them to different values for each memory section, as the internal addresses in one-bit units of said memory;

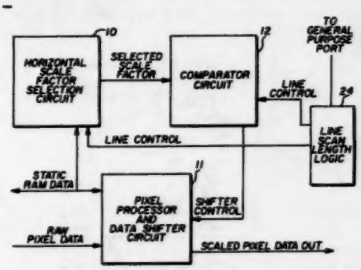
g) barrel-shift means (BSC, DRR), including means for connecting m data input/output lines of said memory sections with the data buses for transmitting data in one-word units, for circularly shifting the connecting points between said data input/output lines and data buses by the number corresponding to one-bit unit addresses designated by said Y address designating means.

5,068,905

SCALER GATE ARRAY FOR SCALING IMAGE DATA

James I. Hackett, Victor; David W. Dellert, and Mark R. Knudson, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,059
Int. Cl.[5] G06K *9/42, 9/40;* G09G *1/06*
U.S. Cl. 382—47 11 Claims



1. A scaler gate array for scaling digital image data algorithmically according to subsampling, logical reduction and pixel replication comprising:

a. horizontal scale factor selection means for outputting in a sequence integer scale factors that approximate user selectable horizontal scale factors;

b. data shifter means comprised of:

i. an input data register for receiving digital image data and for processing feedback data to provide shiftable digital image data; and

ii. shifter means coupled to said input data register for selectively shifting said shiftable digital image data in response to control signals;

c. pixel processor means coupled to said data shifter means for receiving the selectively shifted digital image data and for performing scaling operations in response to control signals to provide at an output scaled digital image data; and

d. a comparator means for receiving a horizontal scale factor selection sequence from said horizontal scale factor selection means, and for comparing the number of bits of feedback data in said input data register with a current horizontal scale factor of the scale factor selection sequence, and for utilizing the compared result to generate said control signals for scaling said digital image data.

5,068,906

PROCESSOR FOR EXTRACTING AND MEMORIZING CELL IMAGES

Tokihiro Kosaka, Hyogo, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Mar. 27, 1989, Ser. No. 329,005
Claims priority, application Japan, Apr. 22, 1988, 63-99490
Int. Cl.[5] G06K *9/20*
U.S. Cl. 382—48 2 Claims

1. A cell image extracting and memorizing processing apparatus for extracting individual cell images by window means, from an original cell image field formed by image capture means, classifying cell image into a plurality of types according to cell image size in advance, and storing the individual cell images of the windows of predetermined types on predetermined pages of an editing memory having a plurality of pages, comprising:

(a) first control means for detecting the sizes of the windows of the individual cell images in the original cell image field as well as the pages storing said individual cell images;

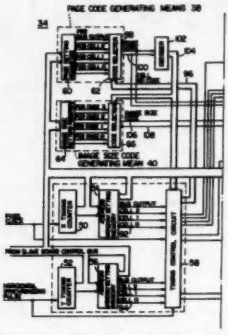
(b) first memory means for storing data from said first control means as predetermined data;

(c) a window setting memory for storing, on the basis of position information indicative of positions of pixels form-

ing the original cell image field, positions of the windows in the original cell image field on a window-by-window basis;

(d) a window extraction timing control circuit for detecting, in synchronization with a scanning signal for scanning the image field, extraction timings of each window based on data in said window setting memory;

(e) page code generating means for detecting, based on the predetermined data, said pages storing said windows the extraction timings of which have been detected;



(f) addressing means for designating storage addresses of said windows on said pages of said editing memory; and

(g) second control means for performing control based on an output from said window extraction timing control circuit and an address designation from said addressing circuit in such a manner that individual cell images in respective ones of the windows are stored in the form of pixel data in the pages of said editing memory.

5,068,907

METHOD OF RECOGNIZING IRRADIATION FIELD

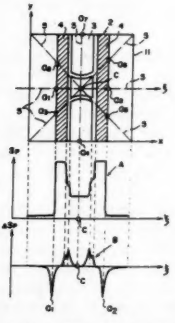
Hideya Takeo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1989, Ser. No. 414,351

Claims priority, application Japan, Oct. 4, 1988, 63-250335

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—48 **1 Claim**



1. A method for determining the shape and location of an irradiation field, which comprises the steps of:

i) after an image signal which comprises a plurality of image signal components representing a radiation image is obtained from a recording medium on which said radiation image has been recorded in a region inside of an irradiation field, detecting a contour point of said irradiation field at the intersection of each of a plurality of radial lines, which extend from a predetermined point located in the region inside of said irradiation field on said recording medium to edges of said recording medium, and the contour of said irradiation field on the basis of the image signal components corresponding to picture elements arrayed along each said line,

ii) in cases where, among the thus detected contour points, a predetermined number of the contour points consecutively arrayed along the direction of said contour, which number is not smaller than three, are present on a single straight line, shifting each of the extreme contour points, which are present at both ends of the array of the contour points present on said single straight line, to the intersection of said single straight line and a straight line on which a contour point, which is adjacent to each said extreme contour point and is not present on said single straight line, lies and which straight line intersects normal to said single straight line, and

iii) determining that the region surrounded by lines connecting the thus found contour points is the irradiation field.

5,068,908

METHOD AND APPARATUS FOR DETECTING MARK FROM IMAGE DATA

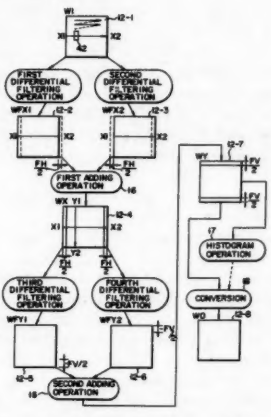
Yoichi Inoue, Tokyo, and Akira Kasano, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 28, 1989, Ser. No. 442,538

Claims priority, application Japan, Nov. 30, 1988, 63-300902

Int. Cl.[5] G06K *9/52*

U.S. Cl. 382—48 **13 Claims**



1. An apparatus for detecting, from original image data, mark image data corresponding to a mark and having a first length in a first direction and a second length in a second direction perpendicular to the first direction in unit of pixels, comprising:

differentiating means responsive to an input differential operation command, for executing a differential operation for density data of the original image data to obtain differential image data;

adding means responsive to an input addition command, for adding two differential image data with respect to density data of the two differential image data such that one differential image data is shifted by a designated length in a designated direction and the other differential image data is shifted by the designated length in an opposite direction to the designated direction; and

control means responsive to an input mark detecting command, for designating the original image data to sequentially output first and second input differential operation commands to said differentiating means to obtain two first

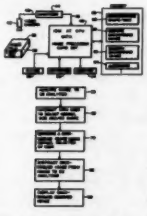
differential image data, respectively, designating the two first differential image data, a half of the first length as the designated length and the first direction as the designated direction to output a first input addition command to said adding means to obtain first added image data, designating the first added image data to sequentially output third and fourth input differential operation commands to said differentiating means to obtain two second differential image data, respectively, designating the two second differential image data, a half of the second length as the designated length and the second direction as the designated direction to output a second input addition command to said adding means to obtain second added image data, and calculating the center of gravity of pixels of the second added image data, each of which has density data larger than a predetermined value, to detect a central position of the mark.

5,068,909

METHOD AND APPARATUS FOR GENERATING QUANTIFIABLE VIDEO DISPLAYS

Hal Rutherford, San Jose, Calif., and Floyd Taub, Silver Spring, Md., assignors to Applied Imaging Corporation, Santa Clara, Calif.

Filed May 18, 1989, Ser. No. 354,255
Int. Cl.[5] G06K *9/40, 9/54, 9/47*
U.S. Cl. 382—49 21 Claims



1. An operator-interactive automated background noise removal system for processing an image of biological data acquired from an autoradiograph, electrophoresis gel, fluorescence gel, photographic film or other media, said system comprising:

a means for displaying a raw image containing a data image comprised of spatial patterns of pixels of varying intensity superimposed over a background image comprised of spatial patterns of pixels of varying intensity;

image conversion means for generating a video output signal from said raw image and converting said video output signal to digital data representing said raw image;

neighborhood selection means for selecting the size and shape of a background removal neighborhood which will be used to process said digital data representing said raw image, said size and shape selected according to the type of biological data being processed;

background detector means for receiving and processing said raw image digital data using said background removal neighborhood to generate digital data representing said background image;

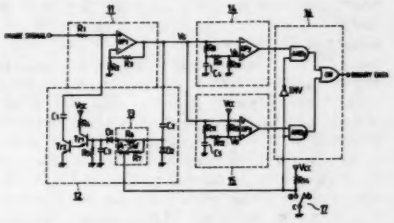
means for subtracting said digital data representing said background image from said digital data representing said raw image to generate digital data representing said data image.

5,068,910

IMAGE SIGNAL PROCESSOR FOR READING DARK AND LIGHT CHARACTERS FROM LIGHT AND DARK BACKGROUNDS RESPECTIVELY

Wataru Ogura, Nagano, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan

Filed Apr. 14, 1989, Ser. No. 338,045
Claims priority, application Japan, Jul. 14, 1988, 63-175548
Int. Cl.[5] G06K *9/38*
U.S. Cl. 382—50 11 Claims



1. An image signal processor comprising:

image pickup means for generating an image signal corresponding to an image to be processed;

automatic gain control means, operatively connected to said image pickup means, for performing an automatic gain control operation in response to a frequency component of said image signal according to whether said image comprises a light background or a dark background;

selection means, operatively connected to said automatic gain control means, for manually setting a cutoff frequency to be used in said automatic gain control operation of said automatic gain control means; and

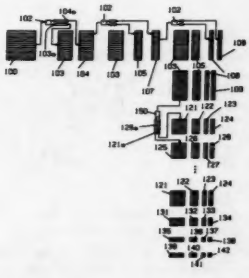
binary encoding means, operatively connected to said automatic gain control means and said selection means, for producing binary data of said image signal according to said cutoff frequency set by said selection means.

5,068,911

METHOD AND APPARATUS FOR REPRESENTING AN IMAGE

Howard L. Resnikoff, Winchester, and William Zettler, Jr., Brookline, both of Mass., assignors to Aware, Inc., Cambridge, Mass.

Filed Feb. 9, 1990, Ser. No. 477,564
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—56 5 Claims



1. An apparatus for generating representation of an input array comprising a two-dimensional array of numbers, said input array being organized as a plurality of linear arrays corresponding to the roes and colums of sa dinput array, said aparatus comprising:

means for storing at least one row of said input array;

linear filtering means for filtering a lnear sequence of num-

bers to generate high and low frequency linear arrays of numbers, said high and low frequency linear arrays representing the high and low frequency components of said linear sequence;

row processing means for causing said linear filtering means to process each said row in said input array to generate a low frequency row array representing said input array, said low frequency row array comprising a two-dmensional array of numbers orgaized as a plurality of rows and columns, said row processing means comprising means for iteratively processing a row of said input array for a predetermined number of iterations, wherein said first iteration comprises causing said linear filtering means to filter said row of said input array and, in successive said iterations, said filtering means is caused to filter the low frequency array generated in the previsou iteration; said row processing means further comprising means for storing the low frequency array generated in the last said iteration in said low frequency row array at a row location corresponding to the location of the row in said input array from which said low frquency array was generated; and

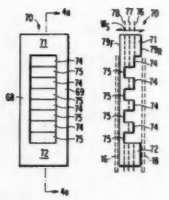
column processing means for cuasing said linear filtering means to process each said column in said low frequency row array to generate a low frequency column array representing said input array said low frequency column array comprising a two-dimensional array of numbers organized as a plurality of rows and columns, said colum processing means comprising means for iteratively processing a column of said low frequency row array for a predetermined number of iterations, wherein said first iteration, said linear filtering means is caused to filter said column of said input array and, in said successive iterations, said filtering means is cuaed to fitler the low frequency column array generated in the previous iteration, said column processing means further comprising means for storing the low frequency array generated in the last said iteration in said low frequency column array at a column location corresponding to the location of the column in said low frequency row array from which said low frequency array was generated.

5,068,912

TRACK GAUGES FOR ALIGNING AND FOCUSSING THE IMAGING SYSTEM IN A HIGH SPEED DOCUMENT HANDLING SYSTEM

David J. Concannon, Farmington Hills; Gary B. Copenhaver, Canton, and Clive E. Catchpole, Birmingham, all of Mich., assignors to Unisys Corp., Detroit, Mich.

Filed Jun. 4, 1990, Ser. No. 532,691
Int. Cl.[5] G06K *7/015*
U.S. Cl. 382—61 **27 Claims**



1. A depth gauge used for aligning an imaging system in a high speed document processor, comprising:

a gauge having height and width dimensions larger than a rectangular window in a track of said high speed document processor, said rectangular window allowing said imaging system to image items within said track;

a means for holding said gauge said track; and

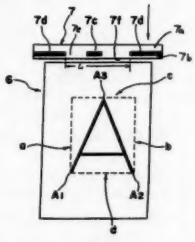
at least two plateaus formed in a front portion of said gauge, a first plateau being positioned a first distance from a back portion of said gauge which is a fixed amount less than a second distance between said back portion of said gauge and a plane running through a vertical axis of said gauge, a second plateau being positioned a third distance from said back portion of said gauge which is said fixed amount more than said second distance.

5,068,913

IMAGE READER WITH PLATEN CRITERIAL MARK FOR DETERMINING DOCUMENT SCAN START

Masamichi Sugiura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 216,194, Jul. 7, 1988, abandoned. This application Oct. 17, 1990, Ser. No. 598,784
Claims priority, application Japan, Jul. 8, 1987, 62-171767
Int. Cl.[5] G06K *9/20, 7/10, 7/20*
U.S. Cl. 382—61 **17 Claims**



6. An image reader comprising:

a platen on which a document is placed at a predetermined position;

a standard member provided on a side of the platen, the document being placed along a side of the member;

a criterial mark arranged near the platen and arranged on the same side as the side on which the standard member is provided;

a line image sensor for detecting the criterial mark and for reading a linear optical image of the document;

means for moving said sensor along the platen from said side of the platen in a direction perpendicular to the linear optical image, whereby said sensor detects the criterial mark and scans the image of the document during a one scan operation;

means for controlling the sensor to start the reading of the image once the sensor has moved a predetermined distance after the detection of the criterial mark, said predetermined distance being substantially equal to the distance between an edge of the criterial mark and said side of the standard member along which the document is to be placed;

determining means for determining boundaries of an actual image area on the document by distinguishing, according to image information obtained by the scanning operation of the document image, the portion of the document where actual images are present from the portion of the document where no actual images are present;

means for sending out linear image information located within said boundaries and determined by said determining means which corresponds to the portion of the document where actual images are present; and

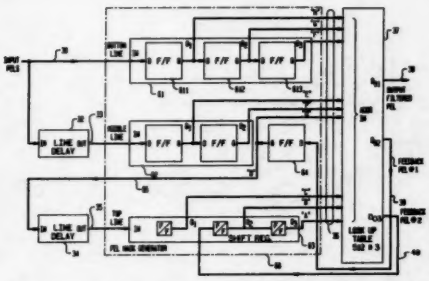
means for forbidding said sending means to send linear image information if the linear image information has no actual image information.

5,068,914

APPARATUS FOR REDUCING ARTIFACTS IN ERROR DIFFUSED IMAGES

Kevin J. Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,487
Int. Cl.[5] H04N 5/21, 1/40
U.S. Cl. 382—54 8 Claims



6. Apparatus for a recursive spatial filter which provides at least two feedback pel values when a predetermined pattern is recognized in an incoming video image, said apparatus comprising:

means, responsive to the pel values that form the incoming image, for producing a pel mask associated with said input pel, said pel mask defining an array of pels including said input pel wherein each of said pels in said mask has a corresponding pel value and wherein the pels that together form said pel mask include respective values of a plurality of the incoming pels and at least one previously produced feedback pel value;

means for storing predetermined patterns of pel values;

means for applying the values of said pels that form said pel mask as an address to the storing means to produce at least two pre-defined feedback values and one of said filtered pel value;

means for applying said produced pre-defined filtered pel value as the output filtered pel value; and

means for applying said produced pre-defined feedback pel value from said storing means as said feedback pel values to said pel mask producing means such that said produced feedback pel value becomes at least two of the pel values for the pels that form the pel mask.

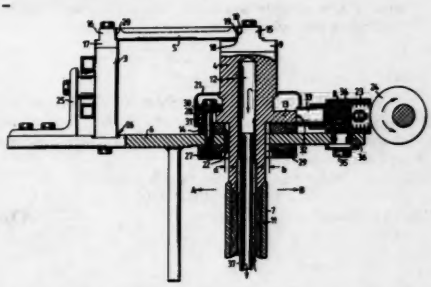
5,068,915

SERIES EVAPORATOR FOR VACUUM VAPOR-DEPOSITION APPARATUS

Jochen Heinz, Linden; Thomas Krug, Hanau; Klemens Ruebsam, Jossgrund, and Hans Kessler, Hanau, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Aug. 29, 1990, Ser. No. 574,596
Claims priority, application Fed. Rep. of Germany, May 14, 1990, 4015385
Int. Cl.[5] C23C 14/00
U.S. Cl. 392—389 7 Claims

1. Series evaporator for vacuum vapor-deposition apparatus, in particular vapor-deposition apparatus for belts, comprising several evaporators 5 with individual power control, heated by passing through a current, supported on column-like, electrical supply lines 3, 4 wherein the column-like supply lines 3, 4 are held by an electrically conductive support body 6 extending over the entire length of the series evaporator, and the supply lines 3 of the one polarity are connected to the support body 6 in an electrically conductive manner whereas the supply lines 4 of the other polarity are passed through the support body 6 in an insulated manner and connected to conducting wires 7 disposed in an insulated manner, characterized in that spring elements 8 apply pressure to the supply lines 4 traversing the support body 6 with play a, b, the action of these spring elements being exerted approximately parallel to the longitudinal extension of the evaporator and pressing the top portions 9 of the supply lines 4 against the front surfaces 10 of the evaporator 5 which they face, wherein the spring elements themselves



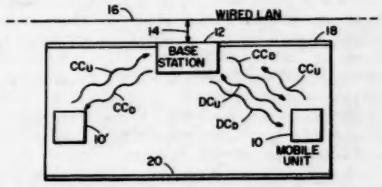
are held and guided in an insulating manner with respect to the support bodies 6 or are made of an insulating material, and the conducting wires 7 connected to these supply lines 4 are conductors passed through by a coolant or are configured as cooling tubes 11 or cooling pipes running parallel to the conducting wires and discharging into chambers or channels 12 provided in the supply lines 4.

5,068,916

COORDINATION OF WIRELESS MEDIUM AMONG A PLURALITY OF BASE STATIONS

Colin G. Harrison, Brookfield, Conn., and Peter D. Hortensius, Goldens Bridge, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1990, Ser. No. 605,628
Int. Cl.[5] H04B 7/00
U.S. Cl. 455—39 20 Claims



13. A method of synchronizing a usage of a wireless transmission medium amongst a plurality of transmission means having a transmission coverage area associated therewith, at least two of the coverage areas having an overlap region therebetween, the transmission medium being utilized in accordance with a transmission period that is comprised of a plurality of consecutively occurring transmission sub-periods, comprising the steps of:

(a) transmitting a message over the wireless transmission medium with only one of the transmission means, the message being repetitively transmitted during each of the transmission sub-periods of at least one of the transmission periods;

(b) receiving the repetitively transmitted messages with one or more transmitter/receiver means disposed within the coverage area associated with the transmitting transmission means;

(c) re-transmitting the received messages with each of the transmitter/receiver means receiving the repetitively

transmitted messages, including a transmitter/receiver means, if any, that is disposed within the overlap region;

(d) receiving the re-transmitted messages from the transmitter/receiver within the overlap region with another transmission means; and responsive to the reception of the re-transmitted messages

(e) synchronizing a timekeeping function of the second transmission means thereto so as to subsequently determine with the timekeeping function a required starting time of a predetermined one of the sub-periods for transmitting or receiving another message therein.

5,068,917

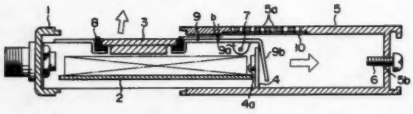
PORTABLE RADIO TRANSCEIVER

Shouji Sugiyama; Daisuke Ohtani, and Tadao Tajima, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 29, 1989, Ser. No. 414,298

Int. Cl.[5] H04B *1/08*

U.S. Cl. 455—90 **6 Claims**



1. A portable transceiver comprising:

a chassis having end sides;

a manipulating section on an electronic circuit carried by said chassis;

an attaching plate pivotally attached on one of said end sides of said chassis;

a speaker attached on said attaching plate;

a housing having side walls and an aperture means formed in a first one of said side walls; and

means for swinging said attaching plate and holding said attaching plate against said aperture means when said chassis is bottomed in said housing, wherein said attaching plate has a bent end part substantially perpendicular to said attaching plate which abuts against a second one of said side walls of said housing when said chassis is bottomed in said housing, said bent end part has a screw hole formed therein, and said housing has a screw hole formed in said second one of said side walls associated with said bent end part, said screw hole formed in said bent end part and said screw hole formed in said second one of said side walls associated with said bent end part being aligned with each other when said chassis is bottomed in said housing, and a securing screw is fitted in both said screw hole formed in said bent end part and said screw hole formed in said second one of said side walls associated with said bent end part so as to fasten together said bent end part and said second one of said side walls associated with said bent end part.

5,068,918

RECEIVER FOR TERRESTRIAL AM AND SATELLITE FM-TV BROADCASTING SIGNALS

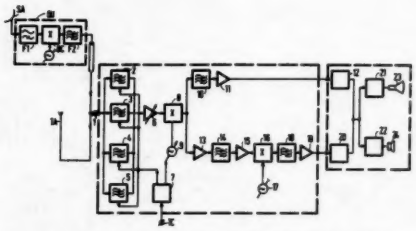
Paulus A. M. Verheijen, and Ronald P. A. Schiltmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1990, Ser. No. 530,687

Claims priority, application Netherlands, Jun. 8, 1989, 8901460

Int. Cl.[5] H04B *1/16*

U.S. Cl. 455—142 **4 Claims**



1. A receiver for terrestrial AM-HF-TV signals and satellite FM-HF-TV signals in a first frequency range and a second frequency range, respectively, which succeed each other in frequency, said first and second frequency ranges having substantially the same frequency width, said receiver comprising a HF-AM/FM section having an input for receiving said AM-HF-TV signals and said FM-HF-TV signals and an output for providing selected portions thereof; a mixing circuit common for the AM-HF-TV and FM-HF-TV signals coupled to the output of said HF-AM/FM section; and an IF device coupled to an output of said mixing circuit, said receiver further comprising a tunning oscillator for applying oscillator mixing signals to the mixing circuit for a frequency conversion of the AM-HF-TV signals into a first AM intermediate frequency signal and a frequency conversion of the FM-HF-TV signals into an FM intermediate frequency signal, said first AM intermediate frequency signal and said FM intermediate frequency signal having, respectively, a first AM intermediate frequency and an FM intermediate frequency, of which at least the first AM intermediate frequency is located above the first frequency range; characterized in that said IF device comprises an AM-IF section and an FM-IF section, inputs of which are coupled to an output of the mixing circuit for a separate selection and processing of the first AM and the FM intermediate frequency signals, respectively, and wherein the first AM intermediate frequency is of the order of magnitude of twice the highest frequency of the first frequency range band and the FM intermediate frequency is of the order of magnitude of one-half the lowest frequency of the second frequency range, whereby the tuning oscillator has a tuning range of less than one octave.

DESIGN PATENTS

GRANTED NOV. 26, 1991

ERRATA

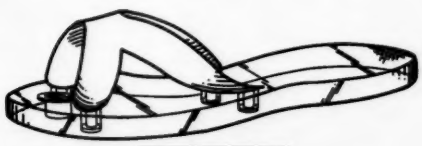
For CLASS	See PATENT NO.
D9-314	321,823

DESIGNS

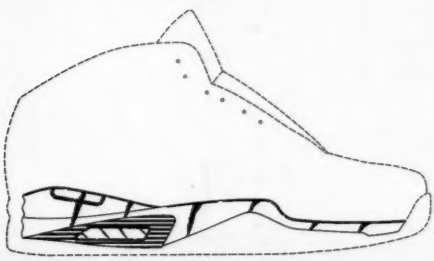
NOVEMBER 26, 1991

321,774
COMBINED CAPE AND COSTUME
James A. Smith, Jr., Rte. 1, Box 513, Weems, Va. 22576
Filed Oct. 21, 1987, Ser. No. 110,962
Term of patent 14 years
U.S. Cl. D2—79

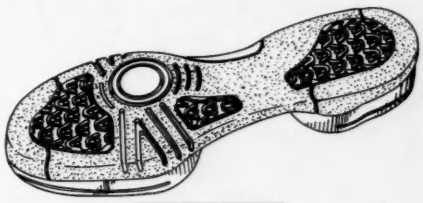
321,775
SANDAL
Timothy J. Barcanic, 5403 Cheshire Meadows Way, Fairfax, Va. 22032
Filed Nov. 3, 1988, Ser. No. 266,806
Term of patent 14 years
U.S. Cl. D2—293



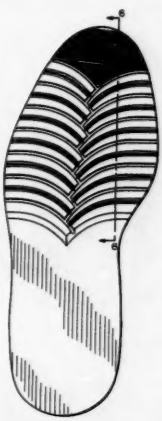
321,776
SHOE MIDSOLE LATERAL SURFACE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 13, 1990, Ser. No. 537,260
Term of patent 14 years
U.S. Cl. D2—314



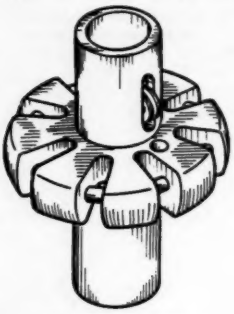
321,777
SHOE SOLE
Toshiaki Kawasaki, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Nov. 6, 1989, Ser. No. 432,211
Claims priority, application Japan, May 12, 1989, 1-17506
Term of patent 14 years
U.S. Cl. D2—320



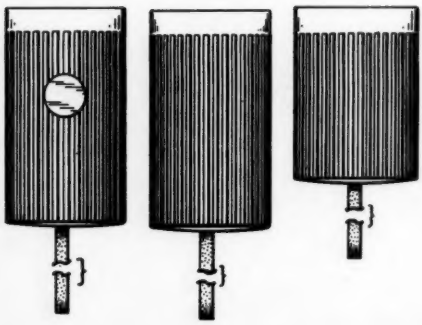
321,778
BOTTOM AND PERIPHERY OF A FOOTWEAR UNIT SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Nov. 15, 1989, Ser. No. 436,816
Term of patent 14 years
U.S. Cl. D2—320



321,779
NOTCH FOR UMBRELLA
Mark J. S. Ma, 12th Floor, 578 Kwang Fu South Road, Taipei, Taiwan
Filed May 15, 1989, Ser. No. 351,039
Term of patent 14 years
U.S. Cl. D3—10



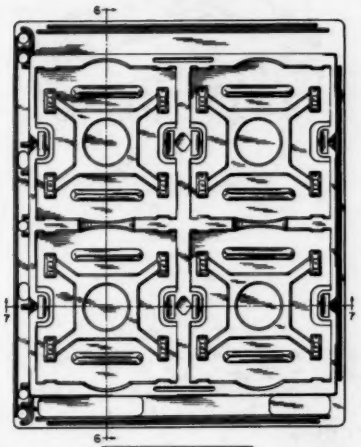
321,780
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporation, Loveland, Ohio
Filed Nov. 14, 1988, Ser. No. 270,291
Term of patent 14 years
U.S. Cl. D3—12



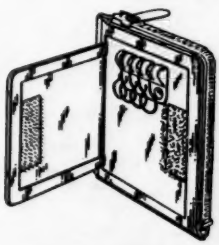
321,781
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Continuation-in-part of Ser. No. 485,732, Feb. 27, 1990, Pat. No. Des. 316,480. This application Sep. 5, 1990, Ser. No. 578,132
The portion of the term of this patent subsequent to Jan. 30, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—12

321,782
UMBRELLA HANDLE
Ann S. Cain, 9144 Dominion Cir., Cincinnati, Ohio 45249, assignor to 'totes', incorporated, Loveland, Ohio
Continuation-in-part of Ser. No. 578,132, Sep. 5, 1990, which is a continuation-in-part of Ser. No. 485,732, Feb. 27, 1990, Pat. No. D. 316,480. This application Jan. 2, 1991, Ser. No. 637,605
The portion of the term of this patent subsequent to Jan. 30, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—12

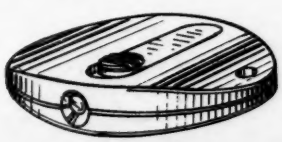
321,783
FILE SHEET FOR MAGNETIC RECORDING MEDIA
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Feb. 21, 1989, Ser. No. 312,967
Claims priority, application Japan, Sep. 26, 1988, 63-37418
Term of patent 14 years
U.S. Cl. D3—35



321,784
WALLET
Henry C. White, 5030 Champion Blvd., Suite 6-293, Boca Raton, Fla. 33496
Filed May 19, 1989, Ser. No. 354,081
Term of patent 14 years
U.S. Cl. D3—56



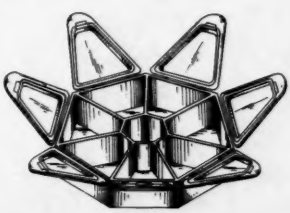
321,785
COMBINED KEY HOLDER AND FLASHLIGHT
Kevin S. Garrity, Madison, Conn., assignor to Garrity Industries, Inc., Madison, Conn.
Filed Aug. 7, 1989, Ser. No. 390,342
Term of patent 14 years
U.S. Cl. D3—63



321,786
KEY HOLDER
Arthur M. Kraus, Weston, Canada, assignor to A.M.K. Investments Ltd., Ontario, Canada
Filed Oct. 24, 1989, Ser. No. 425,996
Claims priority, application Canada, Jul. 21, 1989, 21-07-89-5
Term of patent 14 years
U.S. Cl. D3—65

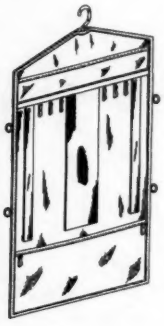
321,787
KEY HOLDER
Arthur M. Kraus, Weston, Canada, assignor to A.M.K. Investments Ltd., Ontario, Canada
Filed Oct. 24, 1989, Ser. No. 425,997
Claims priority, application Canada, Jul. 21, 1989, 21-07-89-3
Term of patent 14 years
U.S. Cl. D3—65

321,788
TOOL BOX
Pi-Chi Chen, No. 1-1, East Lane, Lai Tsuo, Taichung, Taiwan
Filed Jun. 6, 1989, Ser. No. 362,302
Term of patent 14 years
U.S. Cl. D3—74

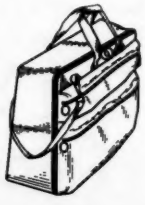


321,789
ACCESSORY ORGANIZER
Ellen Martorella, 11643 Sunshine Pond Rd., Tampa, Fla. 33635
Filed Oct. 16, 1989, Ser. No. 422,297
Term of patent 14 years
U.S. Cl. D3—75

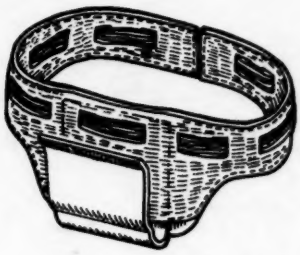
321,790
ACCESSORY ORGANIZER
Ellen Martorella, 11643 Sunshine Pond Rd., Tampa, Fla. 33635
Filed Oct. 16, 1989, Ser. No. 422,298
Term of patent 14 years
U.S. Cl. D3—75



321,791
LUGGAGE CASE
William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 8, 1989, Ser. No. 322,826
Term of patent 14 years
U.S. Cl. D3—77



321,792
SKATEBOARD CARRIER
John P. MacNeary, 345 Vine Hill Rd., Santa Cruz, Calif. 95065
Filed Sep. 14, 1989, Ser. No. 407,035
Term of patent 14 years
U.S. Cl. D3—104

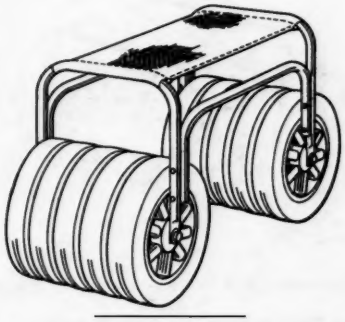


321,793
PUSH BROOM
William C. Bryant, Bell Arthur, N.C., assignor to Empire Brushes, Inc., Greenville, N.C.
Filed Nov. 7, 1989, Ser. No. 432,974
Term of patent 14 years
U.S. Cl. D4—135

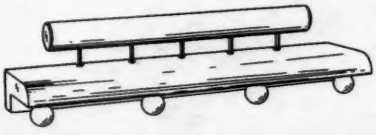
321,794
HOOK
John P. Chap, Lemont, and Dorothy Greenberg, Oak Park, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Aug. 12, 1988, Ser. No. 231,238
Term of patent 14 years
U.S. Cl. D6—323

321,795
SUPPORT HOOK FOR MULTIPLE GARMENT HANGERS
George A. Winston, 29512 Thomas Cir., Inkster, Mich. 48141
Filed Apr. 20, 1990, Ser. No. 511,522
Term of patent 14 years
U.S. Cl. D6—328

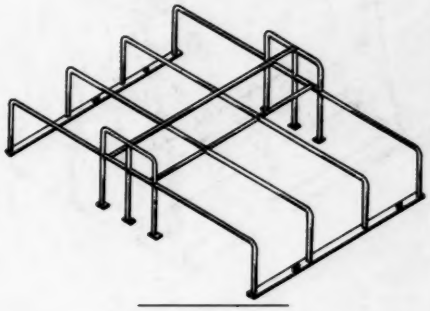
321,796
MOBILE SEAT FOR GARDEN WEEDING
George W. Forrand, P.O. Box 7773-2018 N. Sherman Ave. #19, Madison, Wis. 53704
Filed Jun. 17, 1988, Ser. No. 208,021
Term of patent 14 years
U.S. Cl. D6—330



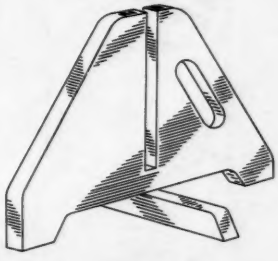
321,797
BENCH
Emilio F. Paris, Barcelona, Spain, assignor to Hijo De E.F. Escofet S.A., Barcelona, Spain
Filed Nov. 30, 1988, Ser. No. 278,162
Claims priority, application Spain, May 31, 1988, 116,103
Term of patent 14 years
U.S. Cl. D6—381



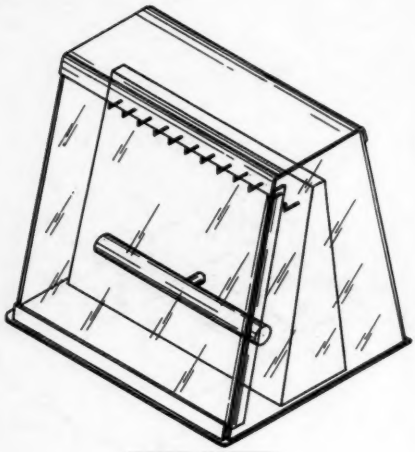
321,798
SHOPPING CART HOLDER
Robert S. Buckley, P.O. Box 246, Keene, N.H. 03431
Filed Jun. 1, 1988, Ser. No. 200,792
Term of patent 14 years
U.S. Cl. D6—462



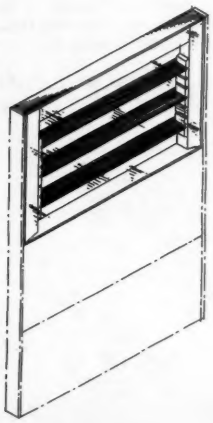
321,799
DISPLAY STAND OR SIMILAR ARTICLE
James Marvy, 5810 Salisbury Ave., Minnetonka, Minn. 55345, and Robert W. Heili, 434 Newton Ave., South, Minneapolis, Minn. 55405
Filed Jan. 9, 1989, Ser. No. 295,026
Term of patent 14 years
U.S. Cl. D6—457



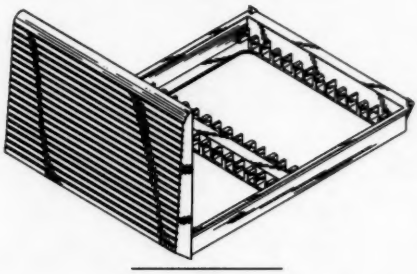
321,800
DISPLAY CASE
Marvin D. Blum, St. Louis, Mo., assignor to American Design Group, Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 879,615, Jun. 27, 1986, Pat. No. Des. 300,394. This application Feb. 9, 1989, Ser. No. 307,980
Term of patent 14 years
U.S. Cl. D6—472



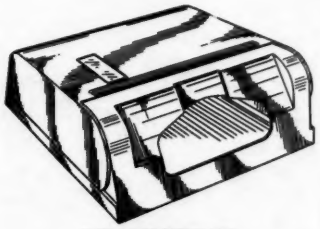
321,801
MODULES SHELF UNIT
Frank A. Friedman, San Francisco, Calif., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed May 25, 1988, Ser. No. 198,386
Term of patent 14 years
U.S. Cl. D6—492



321,802
DRAWER FOR A CASSETTE CABINET OR SIMILAR ARTICLE
Richard D. Smith, 1942 W. Artesia Blvd., Torrance, Calif. 90504
Division of Ser. No. 511,016, Apr. 19, 1990, Pat. No. Des. 320,514. This application May 8, 1991, Ser. No. 697,952
Term of patent 14 years
U.S. Cl. D6—510

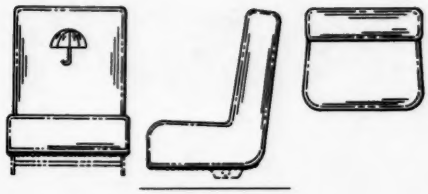


321,803
TISSUE OR TOWEL DISPENSER
Chris R. Dawson, Hassocks, England, assignor to Kimberly-Clark Corporation, Neenah, Wis.
Division of Ser. No. 326,843, Mar. 22, 1989, Pat. No. Des. 316,200. This application Jan. 15, 1991, Ser. No. 642,284
Claims priority, application United Kingdom, Sep. 29, 1988, 1053896
Term of patent 14 years
U.S. Cl. D6—518

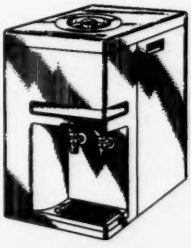


321,804
COMBINED COOLING RACK AND COOKBOOK HOLDER
Robert A. Wolff, Middleburg, and John F. Troxell, Jr., Northumberland, both of Pa., assignors to Wood-Mode, Incorporated, Kreamer, Pa.
Filed Nov. 8, 1989, Ser. No. 434,053
Term of patent 14 years
U.S. Cl. D6—566

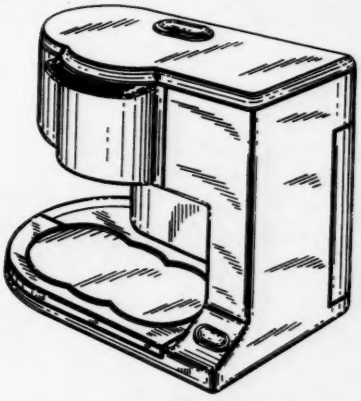
321,805
DISPOSABLE CAR SEAT COVER
Angelo M. Piciullo, 3783-D Olive Rd., Pensacola, Fla. 32514
Filed Dec. 5, 1988, Ser. No. 280,283
Term of patent 14 years
U.S. Cl. D6—611



321,806
DRINKING WATER DISPENSER OR SIMILAR ARTICLE
David B. Chaney, Powell, Ohio, assignor to EBCO Manufacturing Company, Columbus, Ohio
Filed Apr. 6, 1987, Ser. No. 35,153
Term of patent 14 years
U.S. Cl. D7—308



321,807
COFFEE MAKER
Duane D. Adams, Deep River, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Jun. 29, 1988, Ser. No. 212,859
Term of patent 14 years
U.S. Cl. D7—309



321,808
VACUUM BOTTLE

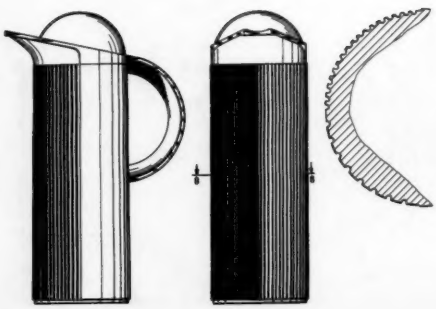
Edgar Rixen, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 247,098

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 5MR9845

Term of patent 14 years

U.S. Cl. D7—317



321,809
ROASTING PAN

Peter Zobrist, Bolton, Canada, assignor to Alcan Aluminum Limited, Ontario, Canada

Filed Mar. 13, 1989, Ser. No. 322,243

Claims priority, application Canada, Sep. 13, 1988, 13-09-88-17

Term of patent 14 years

U.S. Cl. D7—359

321,810
GRIDDLE

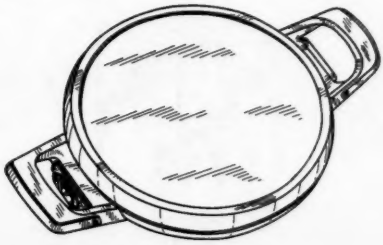
Horst Schultz, Am Dornbusch, Fed. Rep. of Germany, assignor to AMC International Alfa Metalcraft Corporation AG, Switzerland

Filed Apr. 14, 1989, Ser. No. 338,635

Claims priority, application Switzerland, Oct. 19, 1988, 116953

Term of patent 14 years

U.S. Cl. D7—363



321,811

HEAD-HELD MIXER

Ludwig Littmann, Königstein, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

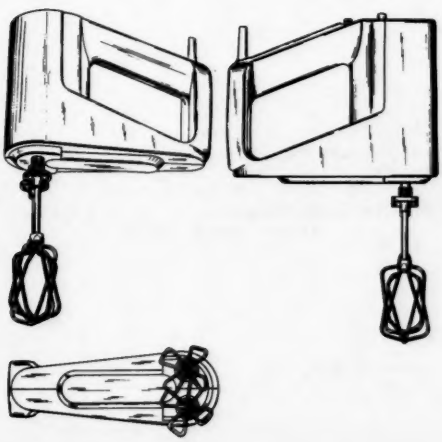
Filed Oct. 26, 1988, Ser. No. 263,122

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 73MR9680

The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—379



321,812

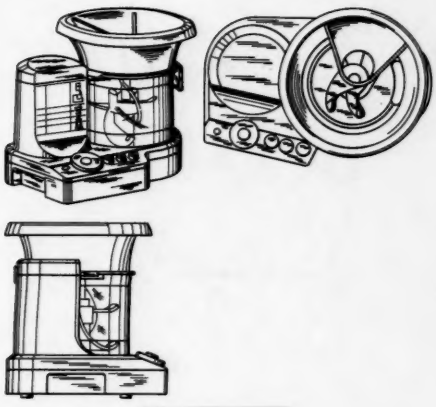
FOOD PROCESSOR

Rudolf Maass, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,939

Term of patent 14 years

U.S. Cl. D7—384



321,813

BOUILLON CUP OR SIMILAR ARTICLE

Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

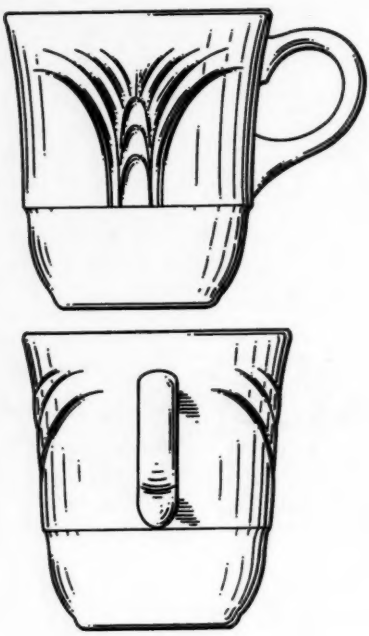
Filed Mar. 10, 1989, Ser. No. 321,330

The portion of the term of this patent subsequent to Oct. 1, 2005, has been disclaimed.

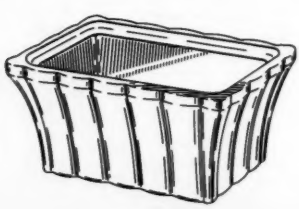
Term of patent 14 years

U.S. Cl. D7—509

321,814
BEVERAGE CUP OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 10, 1989, Ser. No. 321,346
The portion of the term of this patent subsequent to Oct. 1, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—536



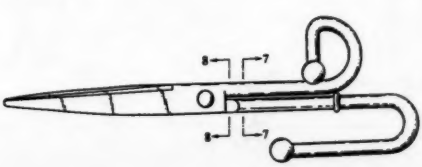
321,815
SUGAR PACKET HOLDER
Michael A. Bowdler, East Liverpool, Ohio, assignor to The Hall China Company, East Liverpool, Ohio
Filed Jul. 19, 1989, Ser. No. 381,849
Term of patent 14 years
U.S. Cl. D7—560



321,816
TREE PRUNER
Fusao Fushiya, and Koji Haneda, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Apr. 9, 1990, Ser. No. 505,529
Term of patent 14 years
U.S. Cl. D8—7

321,817
ADJUSTMENT TOOL FOR AN ORTHOPEDIC BRACE
Andrew W. Hughes, 6108 Webb Bridge Crossing, Alpharetta, Ga. 30201
Filed Jun. 16, 1989, Ser. No. 367,116
Term of patent 14 years
U.S. Cl. D8—14

321,818
SCISSORS
Katsumi Hasegawa, Sagamihara, Japan, assignor to Kai R&D Center Co., Ltd., Seki, Japan
Filed Mar. 6, 1989, Ser. No. 319,643
Claims priority, application Japan, Jul. 15, 1987, 62-28867
Term of patent 14 years
U.S. Cl. D8—57

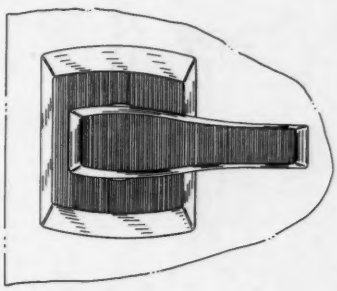


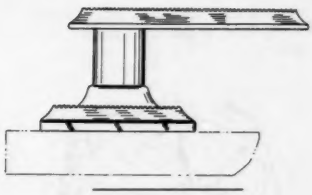
321,819
GUIDE BAR FOR CHAIN SAW
Mitsukazu Takishita, Gifu, Japan, assignor to Sugihara Rinki Co., Ltd., Gifu, Japan
Filed Mar. 1, 1988, Ser. No. 162,460
Claims priority, application Japan, Sep. 2, 1987, 62-36050; Sep. 2, 1987, 62-36051; Sep. 2, 1987, 62-36053; Sep. 2, 1987, 62-36054
Term of patent 14 years
U.S. Cl. D8—70

321,820
KNIFE
A. G. Russell, 103 Terry, Springdale, Ark. 72764
Filed Jul. 27, 1988, Ser. No. 224,781
Term of patent 14 years
U.S. Cl. D8—99

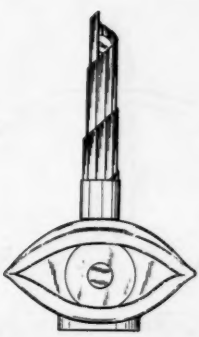
321,821
COMBINED KNIFE AND DRESSING TOOL FOR USE PRIMARILY BY A HUNTER
Robert M. Luchak, 15705 Woodforest, Channelview, Tex. 77530
Filed Nov. 14, 1988, Ser. No. 270,119
Term of patent 14 years
U.S. Cl. D8—99

321,822
LEVER HANDLE AND ROSETTE UNIT
Stanley Pechar, Diamond Bar, Calif., assignor to Kwikset Corporation, Anaheim, Calif.
Filed Oct. 20, 1989, Ser. No. 424,834
Term of patent 14 years
U.S. Cl. D8—301





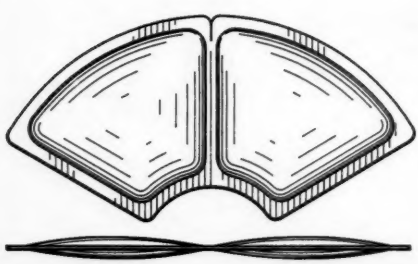
321,823
BOTTLE
Jean P. Guignard, Nesle Normandeuse, France, assignor to Parfums Jean Jacques Vivier, société à responsabilité limitée, Saint-Maur-des Fossés, France
Filed Nov. 30, 1989, Ser. No. 443,649
Claims priority, application World Int. Prop. O., Jun. 1, 1989, DM/013 704
Term of patent 14 years
U.S. Cl. D9—314



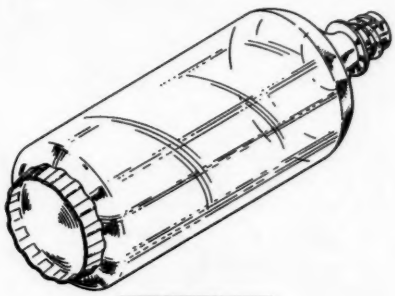
321,824
SHACKLELESS PADLOCK
Paul Appelbaum, 2125 S. Ammons St., Lakewood, Colo. 80227
Filed Feb. 13, 1990, Ser. No. 479,721
Term of patent 14 years
U.S. Cl. D8—334

321,825
CONTAINER
Kurt Schlesselman, Marion, Ind., assignor to Kraft General Foods, Inc., Glenview, Ill.
Filed Jul. 21, 1989, Ser. No. 383,314
Term of patent 14 years
U.S. Cl. D9—310

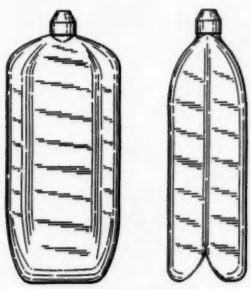
321,826
TOWELETTE PACKAGE
Patricia Page, 503 S. Warminster Rd. Apt. K-3, Hatboro, Pa. 19040
Filed May 23, 1989, Ser. No. 355,361
Term of patent 14 years
U.S. Cl. D9—345



321,827
BOTTLE
Harold D. Bartley, Springfield, and William R. Gaiser, Dayton, both of Ohio, assignors to Broadway Companies, Inc., Dayton, Ohio
Filed Oct. 27, 1988, Ser. No. 263,485
Term of patent 14 years
U.S. Cl. D9—370

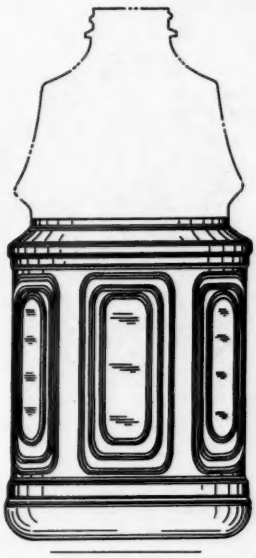


321,828
COMBINED FOLDABLE BOTTLE AND CAP
Walter Düring, Dällikon, Switzerland, assignor to Düring AG, Dällikon, Switzerland
Filed Dec. 20, 1989, Ser. No. 453,471
Term of patent 14 years
U.S. Cl. D9—370



321,829
COMBINED BOTTLE AND CAP
Luigi Iazzetta, Lugano, Switzerland, assignor to Harley-Davidson, Inc., Milwaukee, Wis.
Filed Sep. 29, 1989, Ser. No. 414,926
Term of patent 14 years
U.S. Cl. D9—403

321,830
CONTAINER BOTTOM
Stuart A. York, Tariffville, and Dan Weissman, Simsbury, both of Conn., assignors to Hoover Universal, Inc., Plymouth, Mich.
Filed Jun. 1, 1989, Ser. No. 359,943
Term of patent 14 years
U.S. Cl. D9—434



321,831
ALARM CLOCK
Frank Piarulli, and Vinny Piarulli, both of 1928 Hunt Ave., Bronx, N.Y. 10462
Filed Aug. 3, 1987, Ser. No. 81,106
Term of patent 14 years
U.S. Cl. D10—7

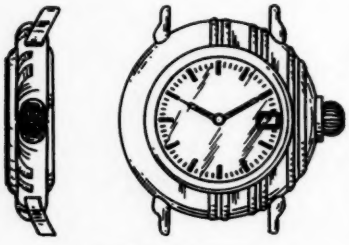
321,832
THREE-SIDE CLOCK
Ching-Ti Chen, Chang-Hua Hsien, Taiwan, assignor to Information Clock Industry Co., Ltd., Taiwan
Filed Jul. 20, 1989, Ser. No. 382,520
Term of patent 14 years
U.S. Cl. D10—14

321,833
WATCH CASE WITH STRAP ADAPTOR
Edwin H. Polansky, Parsippany, and Pobert Arndt, Mahwah, both of N.J., assignors to Duchess Industries, Inc., Lodi, N.J.
Filed Jun. 21, 1989, Ser. No. 369,285
Term of patent 14 years
U.S. Cl. D10—30

321,834
WRISTWATCH
Gerald A. G. Saint-Dizier, Gaillard, France, assignor to Rolex Watch U.S.A., Inc., New York, N.Y.
Filed Oct. 6, 1988, Ser. No. 254,484
Claims priority, application World Int. Prop. O., Apr. 6, 1988, DM/010679
Term of patent 14 years
U.S. Cl. D10—39

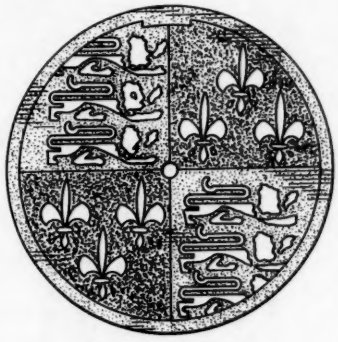
321,835
WRISTWATCH
Yoshio Hirabayashi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Mar. 6, 1989, Ser. No. 319,444
Claims priority, application Japan, Sep. 6, 1988, 63-35189
Term of patent 14 years
U.S. Cl. D10—39

321,836
WATCH
Jorg Hysek, St. Pre, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed May 1, 1989, Ser. No. 346,016
Claims priority, application Switzerland, Nov. 1, 1988, DM/012101
Term of patent 14 years
U.S. Cl. D10—39

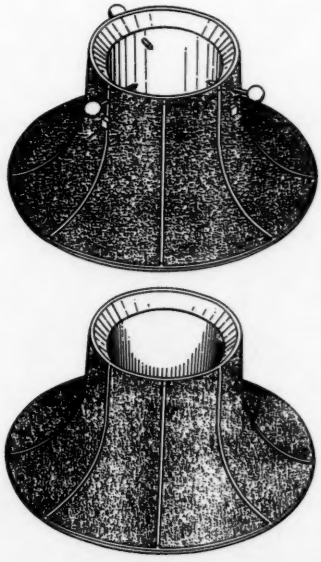


321,837
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Division of Ser. No. 361,106, Jun. 5, 1989, Pat. No. D. 311,150, which is a division of Ser. No. 876,339, Jun. 19, 1986, Pat. No. D. 302,531. This application Apr. 16, 1990, Ser. No. 509,078
Claims priority, application World Int. Prop. O., Dec. 20, 1985, DM/006257
Term of patent 14 years
U.S. Cl. D10—126

321,838
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG, Bienne, Switzerland
Division of Ser. No. 351,553, May 15, 1989, Pat. No. D. 311,149, which is a division of Ser. No. 904,301, Sep. 5, 1986, Pat. No. D. 302,399. This application Apr. 16, 1990, Ser. No. 509,138
Claims priority, application World Int. Prop. O., Mar. 25, 1986, DM/006689
Term of patent 14 years
U.S. Cl. D10—126

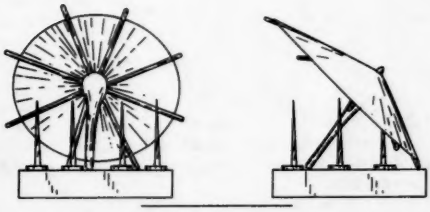


321,839
TREE STAND OR SIMILAR ARTICLE
Leo Rosato, 64 Fairmile Road, R.R. #4, Kemptville, Ontario K0G 1S0, Canada
Filed Jul. 20, 1989, Ser. No. 382,873
Claims priority, application Canada, Feb. 3, 1989, 0302894
Term of patent 14 years
U.S. Cl. D11—130.1



321,840
FINGER RING
J. T. Waugh, and Parke Davis, both of Austin, Tex., assignors to CJC Holdings, Inc., Austin, Tex.
Filed Jul. 25, 1989, Ser. No. 384,462
Term of patent 14 years
U.S. Cl. D11—33

321,841
TABLE TOP NOVELTY
W. Edward Bean, 416 Powder Mill Rd., Nashville, Tenn. 37205
Filed Jul. 5, 1989, Ser. No. 377,006
Term of patent 14 years
U.S. Cl. D11—131



321,842
SAILBOARD SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,743
Term of patent 14 years
U.S. Cl. D11—163

321,843
BASEBALL GLOVE AND BASEBALL SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,746
Term of patent 14 years
U.S. Cl. D11—157

321,844
GOLF BAG SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,742
Term of patent 14 years
U.S. Cl. D11—157

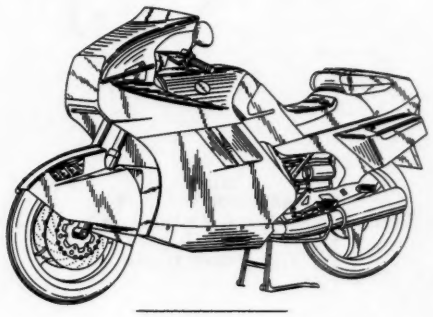
321,845
FOOTBALL HELMET SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,745
Term of patent 14 years
U.S. Cl. D11—157

321,846
BASKETBALL HOOP AND BASKETBALL SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,750
Term of patent 14 years
U.S. Cl. D11—157

321,847
SAILBOAT SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,748
Term of patent 14 years
U.S. Cl. D11—163

321,848
JET SKI SPORTS FIGURE
Peter Nys, Watermolenstraat 20, 2958 Zemst, Belgium
Filed May 26, 1989, Ser. No. 357,749
Term of patent 14 years
U.S. Cl. D11—163

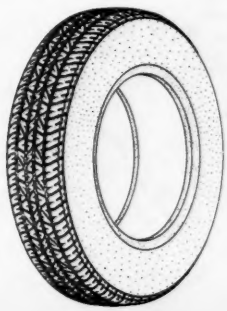
321,849
MOTORCYCLE
Karl-Heinz Abe, Steinebach, and Klaus V. Gevert, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Feb. 28, 1989, Ser. No. 316,686
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 8801346
Term of patent 14 years
U.S. Cl. D12—110



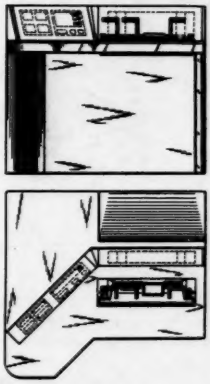
321,850
TANDEM SEAT BABY STROLLER
Chai Mong-Hsing, Walnut, Calif., assignor to Baby Trend, Inc., Pomona, Calif.
Filed Mar. 31, 1989, Ser. No. 330,883
Term of patent 14 years
U.S. Cl. D12—129

321,851
MOTORIZED STROLLER
Arthur C. Louszko, Jr., 28-A Abingdon Ave., Staten Island, N.Y. 10308
Filed Jul. 17, 1989, Ser. No. 380,255
Term of patent 14 years
U.S. Cl. D12—129

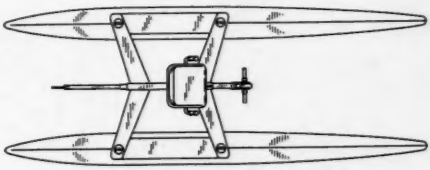
321,852
TIRE
James G. Guspodin, Akron, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Nov. 6, 1989, Ser. No. 432,445
Term of patent 14 years
U.S. Cl. D12—147



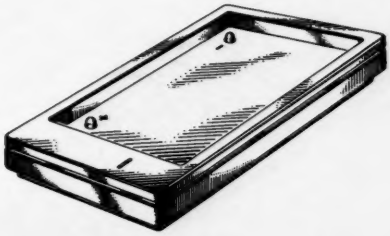
321,853
COMBINED LOCOMOTIVE CONSOLE AND MASTER CONTROLLER COVER
David O. Chase; Peter F. Lynch; Martin V. Maloney, and Scott W. Oslecki, all of Skaneateles, N.N.Y., assignors to General Signal Corporation, Watertown, N.Y.
Filed Sep. 18, 1989, Ser. No. 408,596
Term of patent 14 years
U.S. Cl. D12—192



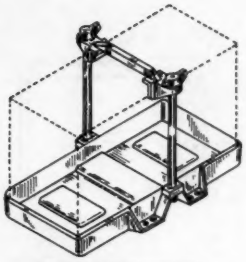
321,854
PEDAL OPERATED WATER CYCLE
John J. Foley; Ralph M. Eide, and Ranald I. MacDonell, all of P.O. Box 68386, Oak Grove, Oreg. 97268
Filed Mar. 2, 1990, Ser. No. 487,244
Term of patent 14 years
U.S. Cl. D12—306



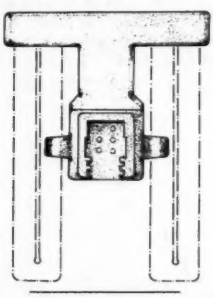
321,855
BATTERY RECHARGER
Grant D. Ross, Jr., Morgan Hill, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Mar. 20, 1989, Ser. No. 326,205
Term of patent 14 years
U.S. Cl. D13—107



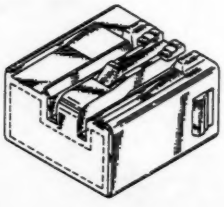
321,856
BATTERY STORAGE TRAY
Warwick M. Whitley, II, Lynn Haven, Fla., and James L. Kusiak, Grand Rapids, Mich., assignors to Attwood Corporation, Lowell, Mich.
Filed Sep. 28, 1989, Ser. No. 414,078
Term of patent 14 years
U.S. Cl. D13—119



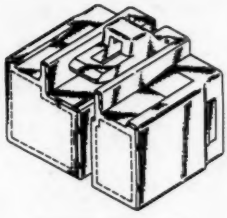
321,857
FLUORESCENT LAMP HOLDER OR THE LIKE
Ronald G. Blaisdell, Saugus, and Robert Y. Pai, Hamilton, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Dec. 1, 1989, Ser. No. 444,333
Term of patent 14 years
U.S. Cl. D13—136



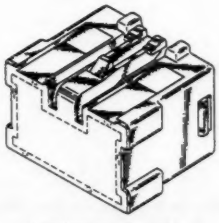
321,858
HOUSING FOR AN ELECTRICAL CONNECTOR
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Shigekazu Wakata, Yokkaichi; Shinichi Yamada, Yokkaichi, and Nobuyuki Asakawa, Yokkaichi, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Apr. 18, 1989, Ser. No. 339,625
Claims priority, application Japan, Oct. 20, 1988, 63-41156
Term of patent 14 years
U.S. Cl. D13—147



321,859
HOUSING FOR AN ELECTRICAL CONNECTOR
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Shigekazu Wakata, Yokkaichi; Shinichi Yamada, Yokkaichi, and Toshikazu Nohara, Yokkaichi, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Apr. 18, 1989, Ser. No. 339,635
Claims priority, application Japan, Oct. 20, 1988, 63-41166
The portion of the term of this patent subsequent to Nov. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—146

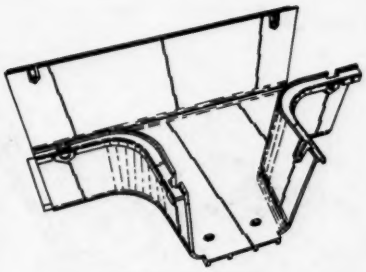


321,860
HOUSING FOR AN ELECTRICAL CONNECTOR
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Shigekazu Wakata, Yokkaichi; Shinichi Yamada, Yokkaichi, and Nobuyuki Asakawa, Yokkaichi, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Apr. 18, 1989, Ser. No. 340,015
Claims priority, application Japan, Oct. 20, 1988, 63-41158
The portion of the term of this patent subsequent to Nov. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—147

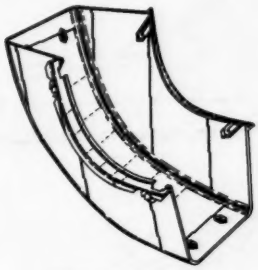


321,861
SCREW-ON ELECTRICAL CONNECTOR
James A. Wennemar, Sycamore, and Scott M. Golden, DeKalb, both of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.
Filed Mar. 24, 1989, Ser. No. 328,553
Term of patent 14 years
U.S. Cl. D13—150

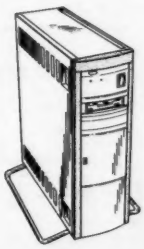
321,862
GUIDING TROUGH, HORIZONTAL T FOR OPTICAL FIBERS
Roy Henneberger, 1596 Clemson Dr., Eagan, Minn. 55122
Filed Jul. 31, 1989, Ser. No. 387,647
Term of patent 14 years
U.S. Cl. D13—155



321,863
GUIDING TROUGH, 90 DEGREE UP ELBOW FOR OPTICAL FIBERS
Roy Henneberger, 1596 Clemson Dr., Eagan, Minn. 55122
Filed Jul. 31, 1989, Ser. No. 387,649
Term of patent 14 years
U.S. Cl. D13—155

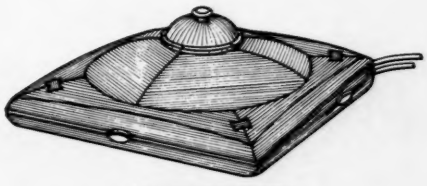


321,864
COMPUTER
Thomas A. Tedham, Salem, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Dec. 29, 1988, Ser. No. 291,820
The portion of the term of this patent subsequent to Dec. 4, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—100

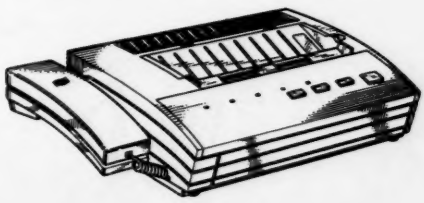


321,865
ELECTRONIC NOTEPAD FOR DATA ENTRY
Michael D. Derocher, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 27, 1989, Ser. No. 428,074
Term of patent 14 years
U.S. Cl. D14—100

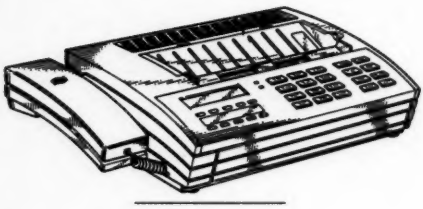
321,866
COMBINATION LAP-TOP COMPUTER CONSOLE AND MOUSE
Thomas J. Newhouse, 0-10923 2nd Ave., NW., Grand Rapids, Mich. 49504
Filed Feb. 4, 1987, Ser. No. 10,833
Term of patent 14 years
U.S. Cl. D14—106



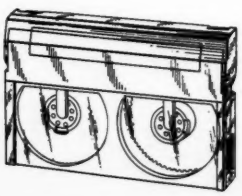
321,867
FACSIMILE
Curt Anderson, Pleasanton, Calif., assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed May 22, 1990, Ser. No. 526,620
Term of patent 14 years
U.S. Cl. D14—118



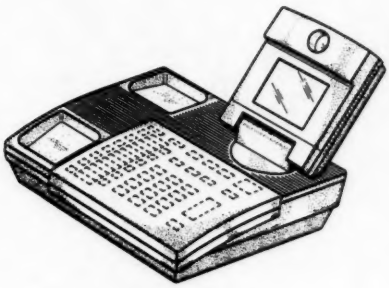
321,868
FACSIMILE
Curt Anderson, Pleasanton, Calif., assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed May 22, 1990, Ser. No. 526,621
Term of patent 14 years
U.S. Cl. D14—118

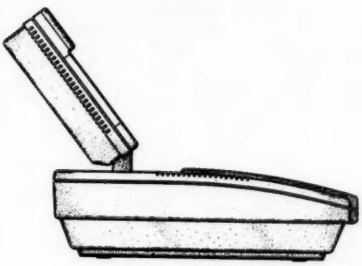


321,869
VIDEO CASSETTE TAPE
Yuko Nakamura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed May 17, 1988, Ser. No. 195,014
Claims priority, application Japan, Nov. 17, 1987, 62-47044
Term of patent 14 years
U.S. Cl. D14—121

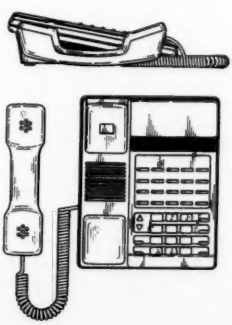


321,870
VIDEO TELEPHONE SET
Robert L. Beecher, II; Anthony J. Grewe, both of Fishers, Ind.; Jonathan A. Marks, New York, N.Y.; John N. McGarvey, Drexel Hill, Pa.; Louis D. Vining, Indianapolis, Ind., and Michael P. Zambelli, Livingston, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 23, 1990, Ser. No. 618,327
Term of patent 14 years
U.S. Cl. D14—130

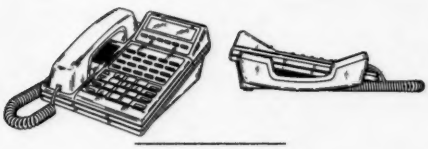




321,871
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 11, 1990, Ser. No. 536,226
Claims priority, application Japan, Dec. 12, 1989, 1-44933
Term of patent 14 years
U.S. Cl. D14—151

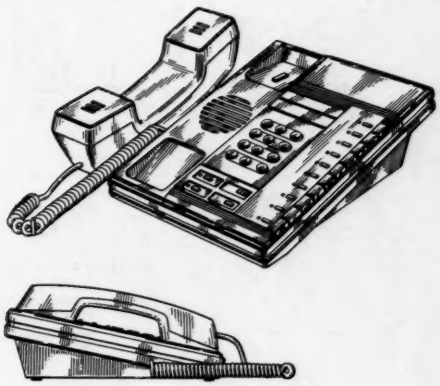


321,872
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 11, 1990, Ser. No. 536,412
Claims priority, application Japan, Dec. 12, 1989, 1-44932
Term of patent 14 years
U.S. Cl. D14—151

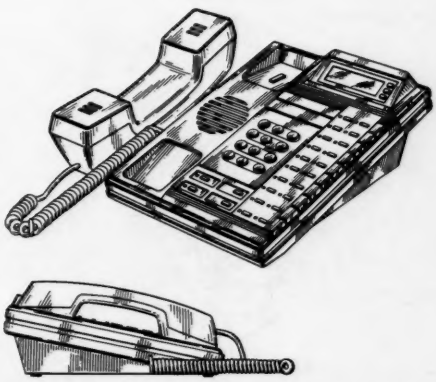


321,873
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 20, 1990, Ser. No. 585,365
Claims priority, application Japan, Mar. 20, 1990, 2-9082
Term of patent 14 years
U.S. Cl. D14—151

321,874
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 20, 1990, Ser. No. 585,366
Claims priority, application Japan, Mar. 20, 1990, 2-9081
Term of patent 14 years
U.S. Cl. D14—151



321,875
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 20, 1990, Ser. No. 585,372
Claims priority, application Japan, Mar. 22, 1990, 2-9302
Term of patent 14 years
U.S. Cl. D14—151

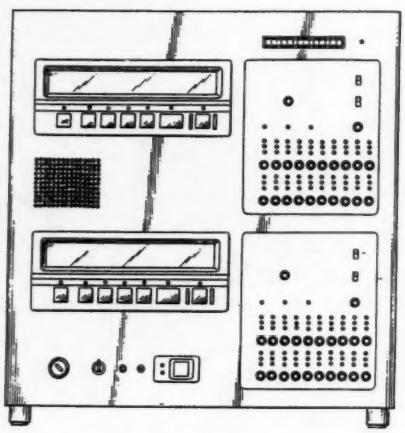


321,876

DATA RECORDER/REPRODUCER

Masafumi Ito, Tokyo; Shigeru Hasegawa, Kodaira; Minoru Sube, Hachioji, and Katsuhiro Takashima, Yokohama, all of Japan, assignors to TEAC Corporation, Japan

Filed Jun. 26, 1989, Ser. No. 371,403
Claims priority, application Japan, Jan. 9, 1989, 1-275
Term of patent 14 years
U.S. Cl. D14—164



321,878

COMBINED PAGER AND MAGNETIC KEY

Beverly J. Brenda, 25021 Acacia La., Laguna Hills, Calif. 92653; Hassin A. Abiney, 18233 Muirwoods Ct., Fountain Valley, Calif. 92708, and Roger McDiarmid, 8531 Meadow Brook Ave., #204, Garden Grove, Calif. 92704

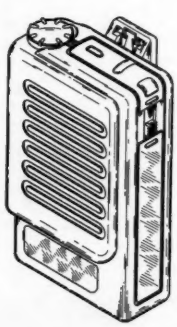
Filed Mar. 1, 1990, Ser. No. 487,174
Term of patent 14 years
U.S. Cl. D14—191

321,877

DISPLAY PAGER OR SIMILAR ARTICLE

William J. Scheid, Coral Springs, and Richard J. Gordecki, Ocean Ridge, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 15, 1989, Ser. No. 408,177
Term of patent 14 years
U.S. Cl. D14—191



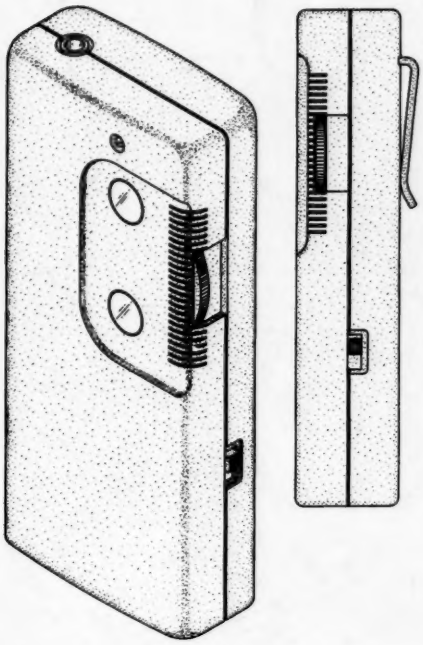
321,879

STEREO RADIO

Ronald Emmerling, Bay Head, N.J., assignor to Gemini Industries Inc., Clifton, N.J.

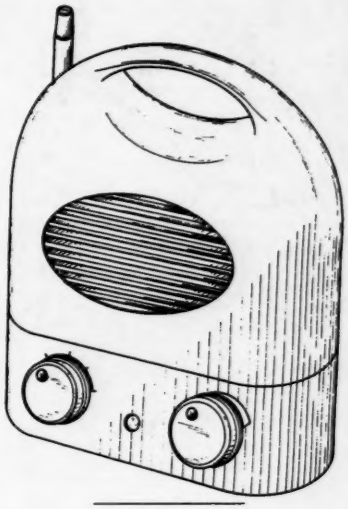
Filed May 15, 1989, Ser. No. 351,911
Term of patent 14 years
U.S. Cl. D14—192

321,880
STEREO RADIO
Ronald Emmerling, Bay Head, N.J., assignor to Gemini Industries Inc., Clifton, N.J.
Filed May 15, 1989, Ser. No. 352,176
Term of patent 14 years
U.S. Cl. D14—192



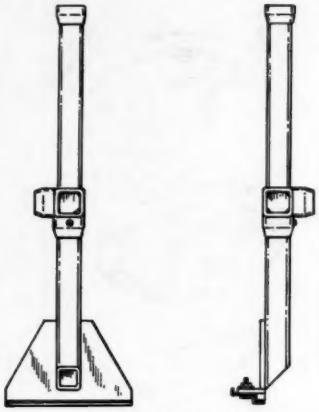
321,881
RADIO
Donald C. Hopewell, 5123 Pony Soldier Dr., Colorado Springs, Colo. 80917
Filed Jun. 5, 1989, Ser. No. 361,108
Term of patent 14 years
U.S. Cl. D14—192

321,882
RADIO RECEIVER
Liu M. Huei, 8F-2, No. 6, Min Sheng W. Rd., Taipei, Taiwan
Filed Dec. 13, 1989, Ser. No. 450,725
Term of patent 14 years
U.S. Cl. D14—196

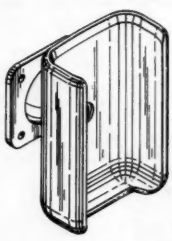


321,883
ANTENNA
Robert L. Borchardt, New York, N.Y., assignor to Recoton Corporation, Long Island City, N.Y.
Filed Jul. 20, 1989, Ser. No. 383,349
Term of patent 14 years
U.S. Cl. D14—230

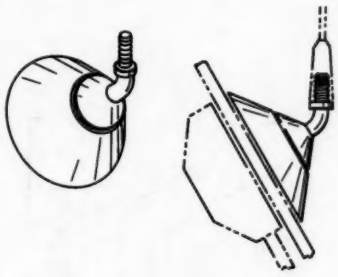
321,884
ANTENNA
David Barrett, P.O. Box 9516, Pompano Beach, Fla. 33060
Filed May 16, 1989, Ser. No. 353,520
Term of patent 14 years
U.S. Cl. D14—234



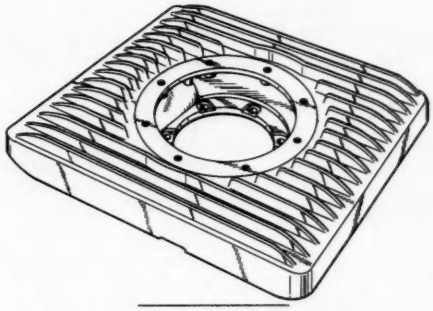
321,885
HOLDER FOR A PORTABLE TELEPHONE HANDSET
Christopher Sheldrake, Basingstoke, England, assignor to Technophone Limited, Surrey, England
Filed Oct. 4, 1990, Ser. No. 592,835
Claims priority, application United Kingdom, Apr. 12, 1990, 2006137
Term of patent 14 years
U.S. Cl. D14—253



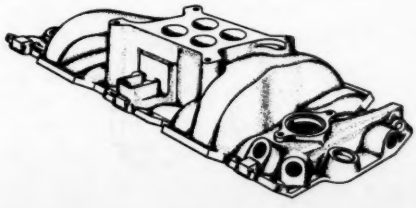
321,886
ANTENNA MOUNT
Donald E. Metivier, Denton, Tex., assignor to Alliance Telecommunications Corp., Dallas, Tex.
Filed Mar. 21, 1989, Ser. No. 326,261
Term of patent 14 years
U.S. Cl. D14—238



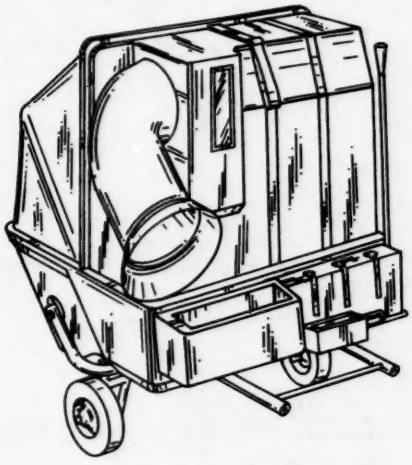
321,887
COMBINED OIL SUMP AND COOLER
Robert A. Tomlinson, 28813 Farmersville Blvd., Farmersville, Calif. 93223
Filed Apr. 12, 1989, Ser. No. 337,128
Term of patent 14 years
U.S. Cl. D15—5



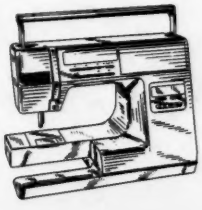
321,888
INTAKE MANIFOLD
J. V. Brotherton, Mena, Ark., assignor to Brodix, Inc., Mena, Ark.
Filed Oct. 6, 1989, Ser. No. 417,851
Term of patent 14 years
U.S. Cl. D15—5



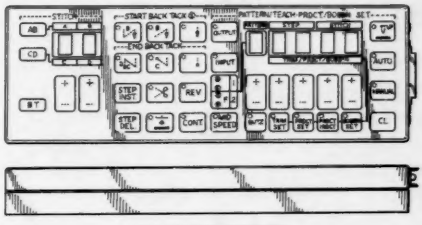
321,889
GRASS COLLECTING CART FOR A RIDING LAWN MOWER
Stephen R. Burns, Duluth; Timothy J. Boesch, Roswell; Matthew D. Rao, Alpharetta; Stuart A. Cook, Norcross, all of Ga.; Jack M. Curtis, Santa Fe, and Jack M. Boone, Brentwood, both of Tenn., assignors to The Murray Ohio Manufacturing Company, Brentwood, Tenn.
Filed Feb. 8, 1989, Ser. No. 307,595
Term of patent 14 years
U.S. Cl. D15—17



321,890
SEWING MACHINE
Nobufusa Kuroki, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Mar. 17, 1989, Ser. No. 325,352
Claims priority, application Japan, Feb. 17, 1989, 1-5598
Term of patent 14 years
U.S. Cl. D15—70

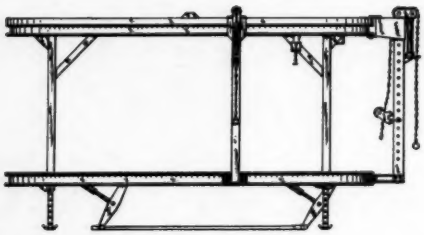


321,891
CONTROLLER FOR A SEWING MACHINE
Hiroshi Kumatani; Satomi Yamauchi, both of Nagoya, and Takanobu Fujimoto, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1989, Ser. No. 436,536
Claims priority, application Japan, May 15, 1989, 1-17591
Term of patent 14 years
U.S. Cl. D15—72

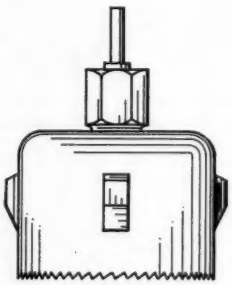


321,892
BOXING TOP ACTUATOR
Roger L. Watford, 2126 Wilderness Point, Kingwood, Tex. 77339
Filed Aug. 23, 1988, Ser. No. 235,192
Term of patent 14 years
U.S. Cl. D15—122

321,893
DEVICE FOR REPAIRING AND STRENGTHENING VEHICLES
Carl R. Field, Ankeny, Iowa, assignor to Duz-Mor, Inc., Des Moines, Iowa
Filed Nov. 2, 1988, Ser. No. 265,925
Term of patent 14 years
U.S. Cl. D15—122

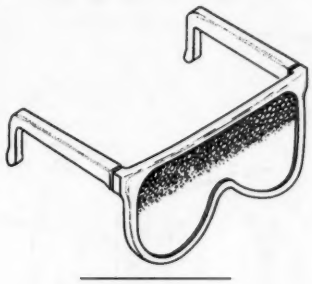


321,894
PIPE FITTING REAMER
Raymond L. Harris, 4971 Date Ave., Sacramento, Calif. 95841
Filed Feb. 6, 1989, Ser. No. 306,578
Term of patent 14 years
U.S. Cl. D15—139

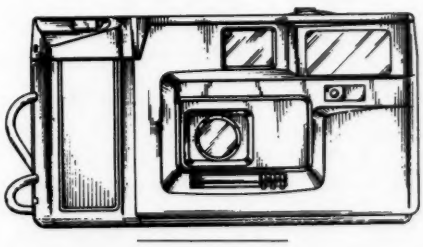


321,895
PAIR OF SUNGLASSES OR THE LIKE
Robert H. Ramp, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Nov. 23, 1988, Ser. No. 275,479
Term of patent 14 years
U.S. Cl. D16—102

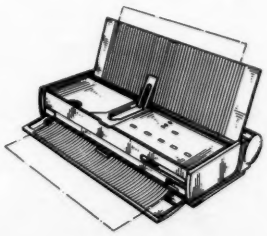
321,896
EYEGLASSES
Theodore P. Croll, 4242 Mechanicsville Rd., Mechanicsville, Pa. 18934
Filed Jan. 30, 1990, Ser. No. 472,486
Term of patent 14 years
U.S. Cl. D16—102



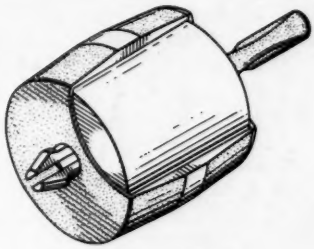
321,897
STILL CAMERA
Alan G. Reddig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 19, 1989, Ser. No. 409,201
Term of patent 14 years
U.S. Cl. D16—209



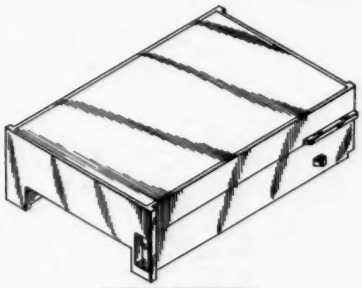
321,898
PORTABLE PRINTER
Kimberly W. Kasee, Spring; Gary W. Pankonien, Houston, and Donald S. Goodrich, The Woodlands, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Jun. 8, 1989, Ser. No. 363,114
Term of patent 14 years
U.S. Cl. D18—55



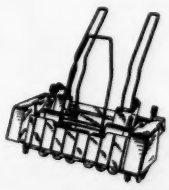
321,899
REINKER CARTRIDGE
Edward Knox, Newbury Park, and Philip N. Smith, Valencia, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Filed Mar. 27, 1989, Ser. No. 328,566
Term of patent 14 years
U.S. Cl. D18—58



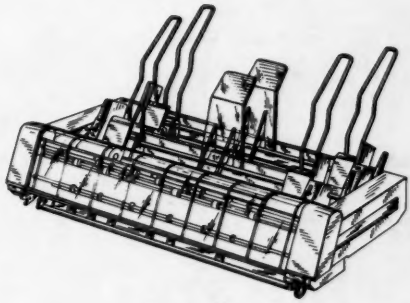
321,900
INK CARTRIDGE
Toshio Kumagai, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Apr. 10, 1989, Ser. No. 335,261
Term of patent 14 years
U.S. Cl. D18—56



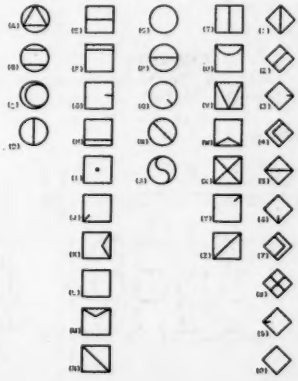
321,901
AUTOMATIC PAPER FEEDER FOR PRINTER
Noritaka Uchibori, and Toshimitsu Ohara, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Jul. 28, 1989, Ser. No. 386,473
Claims priority, application Japan, Feb. 8, 1989, 1-004390
Term of patent 14 years
U.S. Cl. D18—49



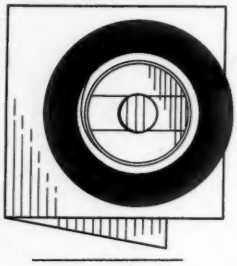
321,902
AUTOMATIC PAPER FEEDER FOR PRINTER
Masayuki Ono; Akira Suzuki; Noritaka Uchibori, all of Nagano, and Friedrich F. Frenkler, Tokyo, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 12, 1989, Ser. No. 421,460
Claims priority, application Japan, Apr. 12, 1989, 1-13511
Term of patent 14 years
U.S. Cl. D18—49



321,903
ALPHANUMERIC FONT
Elia V. Chepaitis, 370 McKinley Ave., New Haven, Conn. 06515
Filed Apr. 22, 1987, Ser. No. 41,324
Term of patent 14 years
U.S. Cl. D18—26

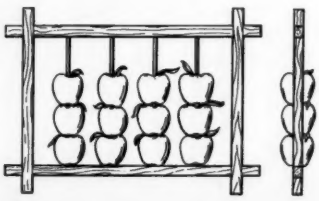


321,904
GREETING CARD
Kevin Thomas, 16301 SW 294th St., Homestead, Fla. 33033
Filed Jan. 3, 1990, Ser. No. 460,607
Term of patent 14 years
U.S. Cl. D19—6



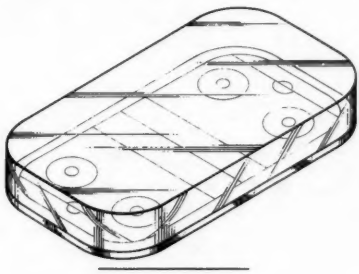
321,905
TWIN-NIBBED WRITING INSTRUMENT
Charlie Tu, 1F, No. 20, Lane 247, An Ho Rd., Taipei, Taiwan
Filed May 18, 1989, Ser. No. 353,507
Term of patent 14 years
U.S. Cl. D19—36

321,906
CALCULATING DEVICE
Marilyn J. Neeley, 7791 Northpointe, Pensacola, Fla. 32514
Filed Nov. 20, 1989, Ser. No. 438,891
Term of patent 14 years
U.S. Cl. D19—64

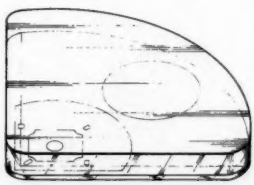


321,907
ELECTRIC PUNCH
Moritoshi Matsuno, Narashino, Japan, assignor to Maruzen Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 20, 1989, Ser. No. 368,526
Claims priority, application Japan, Jan. 6, 1989, 64-102
Term of patent 14 years
U.S. Cl. D19—72

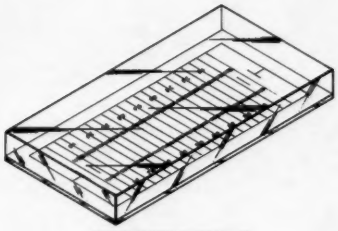
321,908
SUPPORT BASE FOR A DESK SET OR SIMILAR ARTICLE
Mark D. Brady, 154 N. McCadden Pl., Los Angeles, Calif. 90004
Filed Mar. 6, 1989, Ser. No. 319,228
Term of patent 14 years
U.S. Cl. D19—97



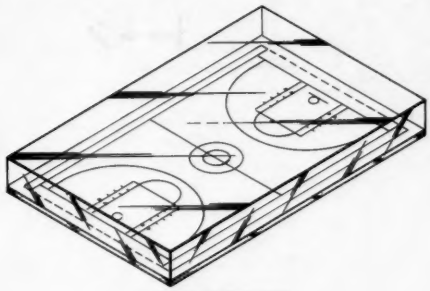
321,909
SUPPORT BASE FOR A DESK SET OR SIMILAR ARTICLE
Mark D. Brady, 154 N. McCadden Pl., Los Angeles, Calif. 90004
Filed Mar. 6, 1989, Ser. No. 319,229
Term of patent 14 years
U.S. Cl. D19—97



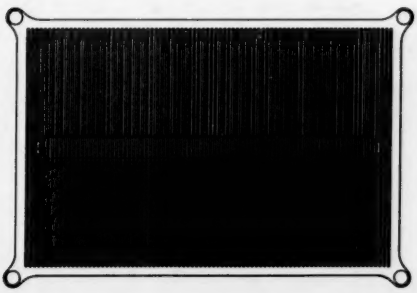
321,910
SUPPORT BASE FOR A DESK SET OR SIMILAR ARTICLE
Mark D. Brady, 154 N. McCadden Pl., Los Angeles, Calif. 90004
Filed May 12, 1989, Ser. No. 351,144
Term of patent 14 years
U.S. Cl. D19—97



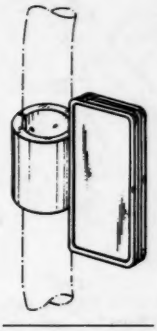
321,911
SUPPORT BASE FOR A DESK SET OR SIMILAR ARTICLE
Mark D. Brady, 154 N. McCadden Pl., Los Angeles, Calif. 90004
Filed May 12, 1989, Ser. No. 351,157
Term of patent 14 years
U.S. Cl. D19—97



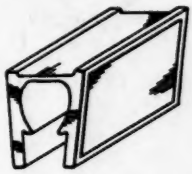
321,912
PAPER TRAY COVER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Division of Ser. No. 101,770, Sep. 28, 1987, Pat. No. Des. 317,628. This application Mar. 11, 1991, Ser. No. 667,087
Term of patent 14 years
U.S. Cl. D19—99



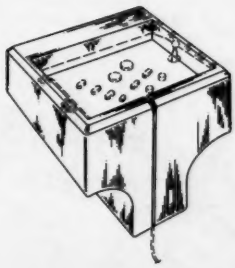
321,913
IDENTIFICATION TAG HOLDER
Stephen H. Wolff, 222 E. 35th St., New York, N.Y. 10016
Filed Sep. 12, 1989, Ser. No. 406,085
Term of patent 14 years
U.S. Cl. D20—27



321,914
PRICE TAG HOLDER OR SIMILAR ARTICLE
Sai Y. Tam, G.P.O. Box 11071, Hong Kong, Hong Kong
Filed Dec. 20, 1989, Ser. No. 453,504
Term of patent 14 years
U.S. Cl. D20—43



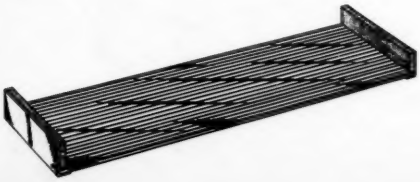
321,915
GAME CONTROLLER HOLDER
David C. Urbanski, 1794 Covington La., Eagan, Minn. 55126
Filed May 5, 1989, Ser. No. 347,786
Term of patent 14 years
U.S. Cl. D21—48



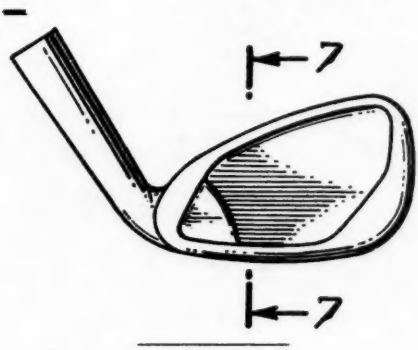
321,916
GAME PIECE OR SIMILAR
Treva Bond, 4 S. Fairview Cir., Portsmouth, Va. 23702
Filed Jun. 14, 1989, Ser. No. 366,038
Term of patent 14 years
U.S. Cl. D21—51

321,917
PATCH QUILT DOLL
Nancy L. Evans, 34273 Iris La., Eastlake, Ohio 44094; Kathleen Dipko, 21331 Morris Ave., Euclid, Ohio 44123; Daisy L. Hudson, 135 Chestnut La., Ste. 315, Richmond Heights, Ohio 44143, and Virginia Brunelle, 25520 Farringdon Ave., Euclid, Ohio 44131
Filed Jul. 31, 1989, Ser. No. 387,715
Term of patent 14 years
U.S. Cl. D21—171

321,918
PHYSICAL EXERCISE PLATFORM
Robert G. Blanchard, 12503 Chateau Forest, San Antonio, Tex. 78230
Filed Sep. 14, 1989, Ser. No. 407,024
Term of patent 14 years
U.S. Cl. D21—191

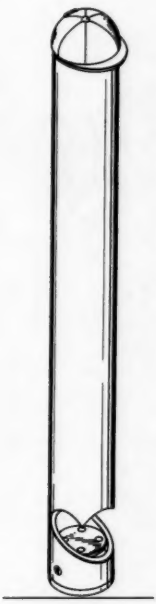


321,919
GOLF CLUB HEAD
Michael H. L. Cheng, 3151 Geronimo Ave., Simi Valley, Calif. 93063
Filed May 31, 1989, Ser. No. 360,205
Term of patent 14 years
U.S. Cl. D21—220



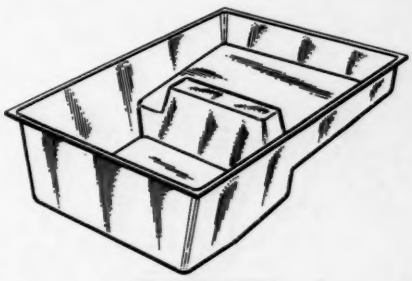
321,920
GOLF CLUB HEAD
Richard E. Parente, Solana Beach; Richard De La Cruz, Pauma Valley, and Richard C. Helmstetter, Carlsbad, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.
Continuation-in-part of Ser. No. 231,070, Aug. 11, 1988. This application Dec. 12, 1989, Ser. No. 450,300
Term of patent 14 years
U.S. Cl. D21—220

321,921
GOLF BALL DISPENSER
Larry K. Johnson, Rte. 1, Box 1300, Palestine, Tex. 75801
Filed Apr. 20, 1989, Ser. No. 341,806
Term of patent 14 years
U.S. Cl. D21—234

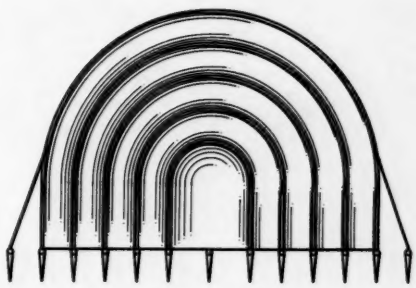


321,922
CHILDREN'S PLAYGROUND SLIDE
Charles W. Basore, 148 S. Walnut Bend, Cordova, Tenn. 38018, and Robert W. Gilbert, 7032 Huntcliff Cove, Germantown, Tenn. 38138
Filed Sep. 10, 1987, Ser. No. 94,933
Term of patent 14 years
U.S. Cl. D21—244

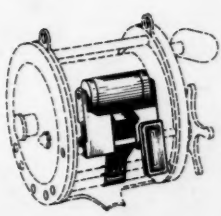
321,923
SAND AND WATER PLAYBOX
Peter W. Ross, R.R. No. 1, Frazerville,Ontario, Canada K0L 1V0
Filed Nov. 10, 1988, Ser. No. 269,948
Claims priority, application Canada, May 11, 1988, 11-05-88-6
Term of patent 14 years
U.S. Cl. D21—252



321,924
PORTABLE SUN PROTECTOR
Yong S. Bonner, 621 Manchester Ter. #3, Inglewood, Calif. 90301
Filed May 18, 1988, Ser. No. 195,527
Term of patent 14 years
U.S. Cl. D21—253

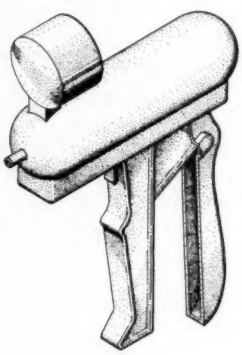


321,925
ANTI-BACKLASH ATTACHMENT FOR FISHING REEL
Lyle I. Shiman, and Naomi Shiman, both of 172 Rock River Dr., Vallejo, Calif. 94589
Filed Apr. 17, 1989, Ser. No. 340,153
Term of patent 14 years
U.S. Cl. D22—140



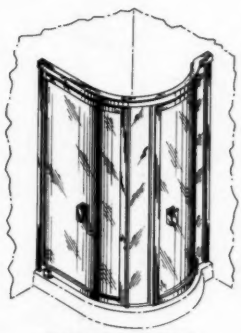
321,926
PAINT SPRAYER HANDLE
Timothy D. Steinberg, Coon Rapids, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.
Filed Jul. 20, 1990, Ser. No. 553,433
Term of patent 14 years
U.S. Cl. D23—223

321,927
HAND HELD VACUUM PUMP FOR USE IN DELIVERY ROOMS
Lawrence M. Smith, P.O. Box 5877, Bend, Oreg. 97708, and Richard N. Cooper, Lake Oswego, Oreg., assignors to Lawrence Smith and Emily Smith, both of Bend, Oreg.
Filed Mar. 27, 1989, Ser. No. 328,959
Term of patent 14 years
U.S. Cl. D23—231



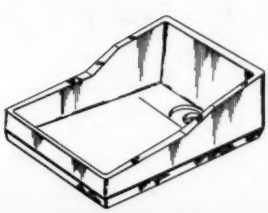
321,928
COMBINATION BALL VALVE AND CHECK VALVE
Joseph V. Milo, Rockaway, N.J., assignor to Universal Valve Company, Inc., Elizabeth, N.J.
Filed Feb. 28, 1989, Ser. No. 318,191
Term of patent 14 years
U.S. Cl. D23—245

321,929
SHOWER ENCLOSURE
Todd D. Dannenberg, Sheboygan, Wis., and Keith L. Poulson, Canyon Country, Calif., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 11, 1988, Ser. No. 142,871
The portion of the term of this patent subsequent to Nov. 19, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—305



321,930
VAPORIZER
Pierre Dinand, Levallois Perret, France, assignor to International Flavors & Fragrances I.F.F. (France) S.a.r.l., New York, N.Y.
Filed Mar. 15, 1989, Ser. No. 323,863
Claims priority, application France, Oct. 28, 1988, 886627
Term of patent 14 years
U.S. Cl. D23—360

321,931
DENTAL MODEL TRIMMER BASIN OR THE LIKE
J. Michael Dierkes, 672 Corbin Lake Ct., Atlanta, Ga. 30350
Filed Jan. 23, 1989, Ser. No. 299,738
Term of patent 14 years
U.S. Cl. D23—294



321,932

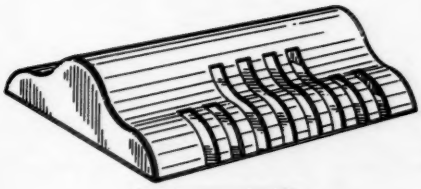
AIR FRESHENER HOUSING

Ralph E. Duszynski, 7962 Hidden Harbour Dr., East, Holland, Ohio 43528

Filed Apr. 19, 1990, Ser. No. 511,386

Term of patent 14 years

U.S. Cl. D23—366



321,933

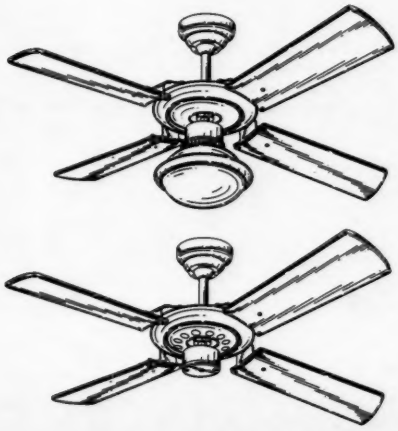
COMBINED ELECTRIC CEILING FAN AND LIGHT OR THE LIKE

Herbert W. Markwardt, and Michael A. Markwardt, both of Forth Worth, Tex., assignors to Encon Industries, Inc., Forth Worth, Tex.

Filed Oct. 22, 1990, Ser. No. 600,674

Term of patent 14 years

U.S. Cl. D23—377



321,934

VENT FOR MOUNTING ON WINDOW SILL OR FRAME

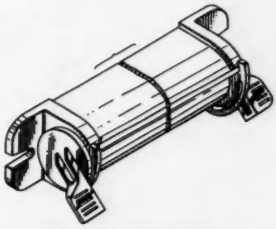
Alan V. Logue, and William Divers, both of Dunmurry Belfast, Northern Ireland, assignors to Brook Design Products Limited, Dunmurry, Northern Ireland

Filed Jun. 14, 1989, Ser. No. 365,561

Claims priority, application United Kingdom, Dec. 14, 1988, 1055687

Term of patent 14 years

U.S. Cl. D23—388



321,935

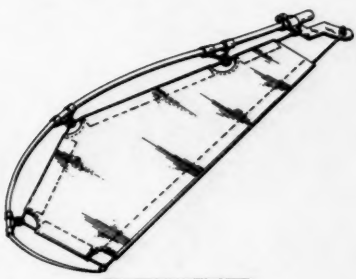
CEILING FAN BLADE

Alexander B. Ignon, Malibu, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.

Filed Feb. 17, 1989, Ser. No. 312,563

Term of patent 14 years

U.S. Cl. D23—413



321,936

BABY BOTTLE

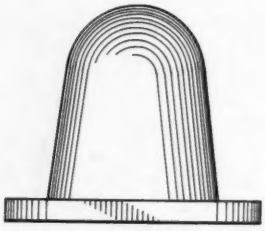
William P. Donovan, 28 Quailcrest Rd., East Lyme, Conn. 06333

Filed Feb. 10, 1989, Ser. No. 308,754

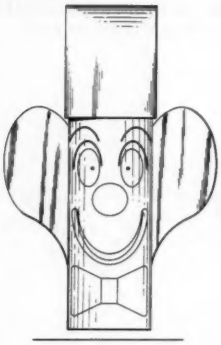
Term of patent 14 years

U.S. Cl. D24—197

321,937
FOOD DISLODGING AID FOR CHOKING VICTIMS
Jeffrey E. Young, 2180 E. Regency Pl., Springfield, Mo. 65804
Filed Sep. 2, 1988, Ser. No. 240,223
Term of patent 14 years
U.S. Cl. D24—133

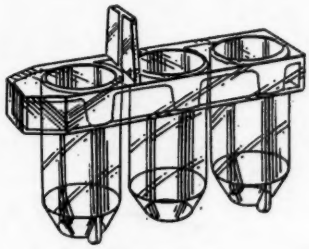


321,938
BABY BOTTLE HOLDER
Cheryl L. Burt, 749 Eimonte Rd., El Cajon, Calif. 92424
Filed Jan. 17, 1989, Ser. No. 297,995
Term of patent 14 years
U.S. Cl. D24—199



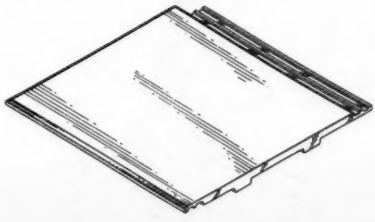
321,939
BABY BOTTLE COVER
Sheila Tom, 1474 Mattagami Street, Gloucester, Ont., Canada K1T 2T7
Filed Apr. 11, 1989, Ser. No. 336,291
Claims priority, application Canada, Oct. 14, 1988, 14-10-88-10
Term of patent 14 years
U.S. Cl. D24—199

321,940
SAMPLE CUP FOR ANALYZER
Michael D'Aquino; Manjeshwar S. Rao, both of Miami, and Howard J. Kirchick, Cooper City, all of Fla., assignors to Baxter Diagnostics Inc., Deerfield, Ill.
Filed Jul. 20, 1989, Ser. No. 383,136
Term of patent 14 years
U.S. Cl. D24—226

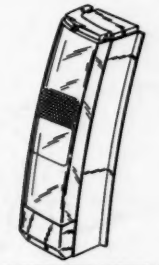


321,941
LIFEGUARD TOWER
David J. Stollery, 3203 Bern Ct., Laguna Beach, Calif. 92651
Filed Jun. 26, 1989, Ser. No. 371,407
Term of patent 14 years
U.S. Cl. D25—16

321,942
TILE
Michael E. Lynn, Leigh, England, assignor to Marley Tile A.G., Zurich, Switzerland
Filed Jan. 27, 1988, Ser. No. 150,314
Claims priority, application United Kingdom, Jul. 27, 1987, 1043681
Term of patent 14 years
U.S. Cl. D25—140

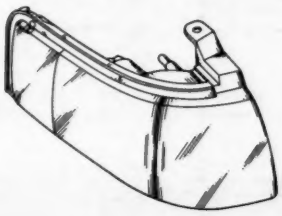


321,943
REAR LIGHT FOR AN AUTOMOBILE
Rolf A. Malmgren, Västra Frölunda, and Frans G. Falck, Torslanda, both of Sweden, assignors to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Jun. 20, 1989, Ser. No. 368,533
Term of patent 14 years
U.S. Cl. D26—28



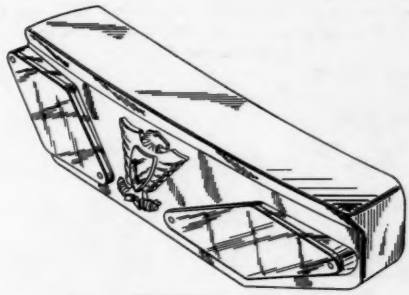
321,944
REAR LIGHT FOR AN AUTOMOBILE
Rolf A. Malmgren, Västra Frölunda, and Frans G. Falck, Torslanda, both of Sweden, assignors to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Jun. 20, 1989, Ser. No. 368,534
Term of patent 14 years
U.S. Cl. D26—28

321,945
AUTOMOBILE FRONT COMBINATION LAMP
Hiroshi Yamamoto, Yokohama, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Apr. 28, 1988, Ser. No. 187,401
Term of patent 14 years
U.S. Cl. D26—35

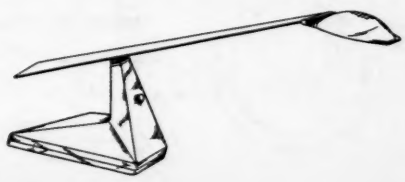


321,946
REAR LIGHT FOR AN AUTOMOBILE
Stig F. O. Falck, Bohus Björkö, and Frans G. Falck, Torslanda, both of Sweden, assignors to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Jun. 20, 1989, Ser. No. 368,538
Term of patent 14 years
U.S. Cl. D26—35

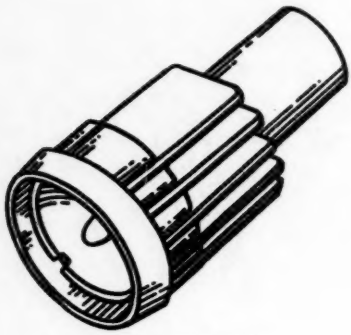
321,947
MOTORCYCLE TAILLIGHT ASSEMBLY
Tom Rudd, Rte. 2, Box 80, North Hudson, Wis. 54016, and Alwin J. Stahel, 1244 Imperial, St. Paul, Minn. 55112
Filed Dec. 22, 1989, Ser. No. 454,849
Term of patent 14 years
U.S. Cl. D26—35



321,948
TABLE LAMP
James C. S. Huang, No. 19, Lane 111, Ho Pont Road, Luchou, Taipei Hsien, Taiwan
Filed Jul. 12, 1990, Ser. No. 551,721
Term of patent 14 years
U.S. Cl. D26—65



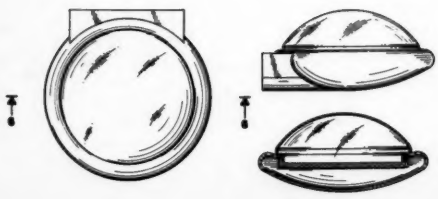
321,949
RECESSED LIGHTING FIXTURE FOR CEILING OR THE LIKE
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Jul. 10, 1989, Ser. No. 377,914
Term of patent 14 years
U.S. Cl. D26—74

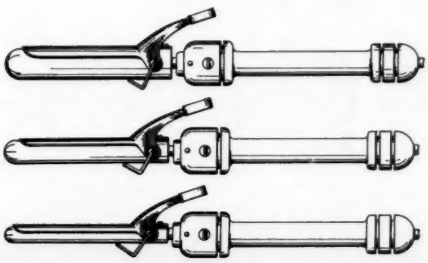


321,950
WALL-MOUNTED LIGHT FIXTURE OR THE LIKE
Axel Enthoven, Wijnegem, Belgium, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 111,521, Oct. 19, 1987, Pat. No. D. 315,844.
This application Feb. 20, 1991, Ser. No. 658,378
Term of patent 14 years
U.S. Cl. D26—92

321,951
DESK LAMP
Menno Dieperink, Amsterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 13, 1990, Ser. No. 509,547
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—107

321,952
CURLING IRON
James G. Montagnino; Betty Butzko; Daniel Santhouse; Tim Hanlon, and Steve Power, all of El Paso, Tex., assignors to Helen of Troy Corporation, El Paso, Tex.
Filed Jan. 17, 1990, Ser. No. 466,699
Term of patent 14 years
U.S. Cl. D28—35

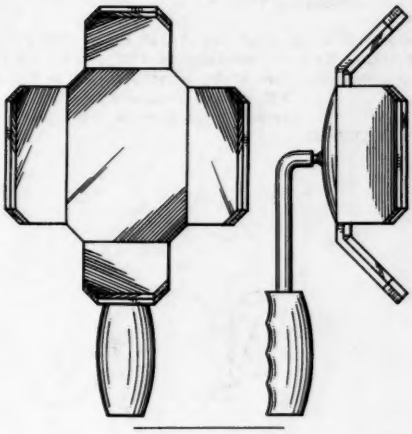




321,953
RAZOR HANDLE
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Continuation of Ser. No. 32,882, Mar. 31, 1987, abandoned. This application May 30, 1990, Ser. No. 501,505
Term of patent 14 years
U.S. Cl. D28—48

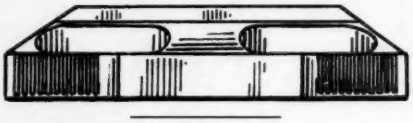
321,954
FINGERNAIL REPAIR DEVICE
David H. Aylott, Tomarton, United Kingdom, assignor to Eylure Limited, Wales, United Kingdom
Filed May 15, 1989, Ser. No. 352,213
Claims priority, application United Kingdom, Nov. 15, 1988, 1054968
Term of patent 14 years
U.S. Cl. D28—57

321,955
ADJUSTABLE FOUR WAY MIRROR
Eric R. Mallory, 2637 N. 28th St., Philadelphia, Pa. 19132
Filed Feb. 6, 1989, Ser. No. 306,590
Term of patent 14 years
U.S. Cl. D28—64.1

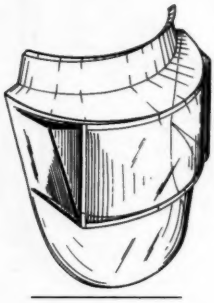


321,956
COMBINED PORTABLE BREATHING UNIT AND HOLSTER THEREFOR
Larry H. Williamson, Huntington Beach, Calif., assignor to Submersible Systems, Inc., Huntington Beach, Calif.
Filed Apr. 25, 1989, Ser. No. 343,515
Term of patent 14 years
U.S. Cl. D29—7

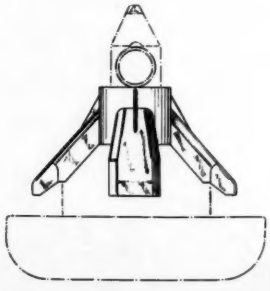
321,957
FACE SHIELD
Tobias Brown, Oak Park, and Burton L. Siegal, Skokie, both of Ill., assignors to Sellstrom Manufacturing Company, Palatine, Ill.
Filed Dec. 14, 1989, Ser. No. 450,841
Term of patent 14 years
U.S. Cl. D29—9



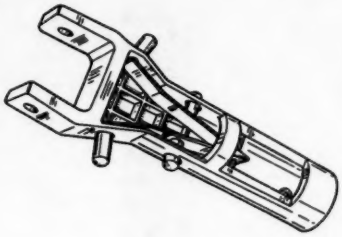
321,958
DISPOSABLE FACESHIELD
Arthur J. Salce, and Richard T. Metcalfe, both of Southbridge, Mass., assignors to Cabot Safety Corporation, Southbridge, Mass.
Continuation-in-part of Ser. No. 152,920, Feb. 5, 1988, Pat. No. D. 308,582. This application Jun. 14, 1988, Ser. No. 206,711
The portion of the term of this patent subsequent to Dec. 29, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D29—16

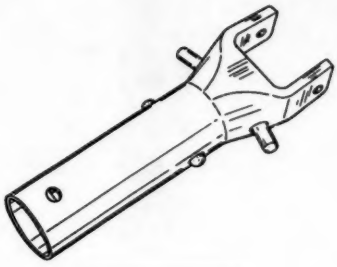


321,959
FEEDER FOR POULTRY
Theodore J. Cole, and Ray E. Swartzendruber, both of Syracuse, Ind., assignors to CTB, Inc., Milford, Ind.
Filed May 15, 1989, Ser. No. 352,039
Term of patent 14 years
U.S. Cl. D30—121

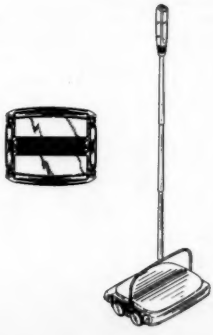


321,960
HANDLE INTERCONNECT BRACKET FOR SCOOPS USED TO CLEAN SWIMMING POOLS
Stephen B. Nicholas, Magill, Australia, assignor to Magnor Pty. Limited, Norwood, Australia
Filed Jan. 25, 1989, Ser. No. 301,998
Claims priority, application Australia, Nov. 22, 1988, 3908/88
Term of patent 14 years
U.S. Cl. D32—35

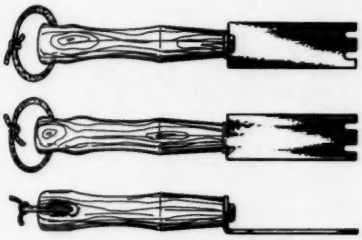




321,961
FLOOR CLEANER
Tsuyoshi Ishii, and Koichi Yoshimura, both of Osaka, Japan, assignors to Yamazaki Corporation, Osaka, Japan
Filed Oct. 4, 1988, Ser. No. 253,211
Claims priority, application Japan, May 27, 1988, 63-21104
Term of patent 14 years
U.S. Cl. D32—38

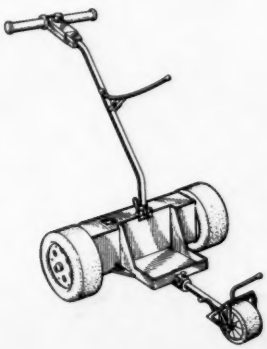


321,962
BARBECUE GRILL CLEANER
Samuel G. Roma, 3065 Clayton St., and Charles J. Guiffre, 2505 Seip Ave., both of Easton, Pa. 18042
Filed Aug. 14, 1990, Ser. No. 567,544
Term of patent 14 years
U.S. Cl. D32—49

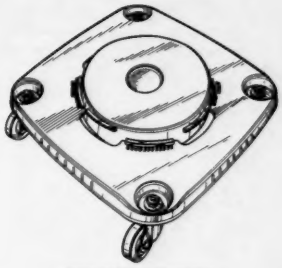


321,963
BOTTLE DRAINING STAND
Anton P. Welder, 209 W. Brandon Dr., Bismarck, N. Dak. 58501
Filed Feb. 25, 1991, Ser. No. 661,316
Term of patent 14 years
U.S. Cl. D32—58

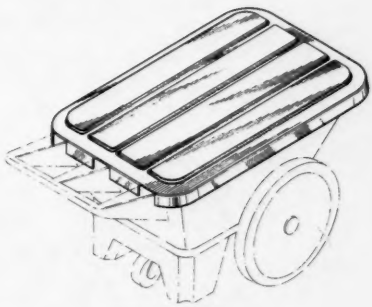
321,964
MOTOR-DRIVEN GOLF-BAG CADDY
Reinold Alterbaum, Rotdornallee 47, 4840 Rheda-Wiedenbruek, Fed. Rep. of Germany
Filed Dec. 2, 1988, Ser. No. 279,189
Term of patent 14 years
U.S. Cl. D34—15



321,965
CONTAINER DOLLY
Paul E. Delmerico, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Mar. 14, 1990, Ser. No. 493,239
Term of patent 14 years
U.S. Cl. D34—23



321,966
STABLE CART LID
John M. Fuller, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Apr. 6, 1989, Ser. No. 334,127
Term of patent 14 years
U.S. Cl. D34—27



321,967
WICKER BASKET
Nimfa O. Lumaban, Calamba, Philippines, assignor to Decra Stone, Inc., Prior Lake, Minn.
Filed Feb. 23, 1989, Ser. No. 314,584
The portion of the term of this patent subsequent to Oct. 22, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—44

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF NOVEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.C.T.M.: *See—*
Ayme, Jacques, 5,067,741, Cl. 280-419.000.

A.F.G. S.r.l.: *See—*
Fusaro, Angelo; and Galeazzi, Giancarlo, 5,067,866, Cl. 414-228.000.

A. H. Robins Company Incorporated: *See—*
Bhogal, Balbir S.; Williams, Michael G.; and Miller, Glenn A., 5,068,104, Cl. 424-88.000.
Taylor, Chandler R., Jr.; Cale. Jr., Albert D.; Johnson, David N.; and Stauffer. Jr., Harold F., 5,068,231, Cl. 514-210.000.

A. O. Smith Corporation: *See—*
Lykes, Robert E.; and King, James L., 5,068,556, Cl. 310-90.000.
Scott, Kenneth C., 5,068,582, Cl. 318-254.000.

Aardvark Corporation: *See—*
Sweeney, Gerald T., 5,067,854, Cl. 405-184.000.

AAW Producktions Aktiengesellschaft: *See—*
Pirchl, Gerhard, 5,067,339, Cl. 72-329.000.

AB Tetra Pak: *See—*
Lindskog, Carl G.; Anderson, Rolf; and Loovv, Christer, 5,068,005, Cl. 156-514.000.

AB Volvo: *See—*
Janiszewski, Grzegorz, 5,067,364, Cl. 74-440.000.

Abb Kabel und Draht GmbH: *See—*
Krieger, Wolfgang, 5,068,497, Cl. 174-106.00R.

ABB Power T & D Company, Inc.: *See—*
Pavlik, Norman M.; Sefko, John; and Miller, Richard A., 5,067,992, Cl. 148-307.000.

ABB Reaktor GmbH: *See—*
Dietrich, Alban, 5,068,721, Cl. 358-100.000.

ABB Vetco Gray Inc.: *See—*
Boehm, Carl F., Jr., 5,067,734, Cl. 277-236.000.

Abbott Laboratories: *See—*
Brooks, Dee W.; and Rodriques, Karen E., 5,068,251, Cl. 514-506.000.

Abbott, Rexford J.; and Wright, David L., to Spectra-Physics Lasers, Inc. Etalon apparatus. 5,068,861, Cl. 372-20.000.

Abe, Akira, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic materials. 5,068,170, Cl. 430-393.000.

Abe, Masayoshi: *See—*
Takagaki, Hidetsugu; Nakanishi, Shigenori; Abe, Masayoshi; Ohki, Hiromi; and Sano, Yoshiyuki, 5,068,364, Cl. 549-415.000.

Abe, Nobumasa; Kobayashi, Atsushi; Watanabe, Koji; Morishita, Norio; and Tanaka, Yuji, to Seiko Epson Corporation. Image forming device. 5,068,684, Cl. 355-27.000.

Abe, Yoshio: *See—*
Kokubo, Tadashi: Yamamuro, Takao; and Abe, Yoshio, 5,068,122, Cl. 427-2.000.

Aburaya, Toshio: *See—*
Kokubo, Kouichi; Tagawa, Shinichi; Kawanishi, Masaki; Sato, Kunihito; Buma, Shuuichi; Yonekawa, Takashi; and Aburaya, Toshio, 5,067,743, Cl. 280-707.000.

Acco World Corporation: *See—*
Cooper, Edward W.; and Guerrieri, Orlando R., 5,067,840, Cl. 402-38.000.

Acer Incorporated: *See—*
Huang, Ali; Tsai, Philips; and Chen, Bonbo, 5,067,681, Cl. 248-442.200.

Achard, Georges: *See—*
Bourgeois, Michel; Chatelin, Roger; Wattiez, Daniel; Sotton, Michel; Belet, Francois; and Achard, Georges, 5,068,113, Cl. 424-496.000.

Achterrath-Tuckerman, Ute; Aurich, Rudolf; Engel, Jurgen; Hettche, Helmut; and Kleeman, Axel, to Asta Pharma Aktiengesellschaft. Synergistic combination of azelastine and theophylline or azelastine and α-mimetics. 5,068,233, Cl. 514-212.000.

Ackermann, Peter: *See—*
Huxley, Alica; Kunz, Walter; Ackermann, Peter; and Sutter, Marius, 5,068,359, Cl. 549-58.000.

Acorn Engineering Company: *See—*
Hafner, V. Walter; and Marshall, Keith D., 5,067,181, Cl. 4-425.000.

Adams, Harry A.: *See—*
Paspek, Stephen C.; Hauser, Jeffrey B.; Eppig, Christopher P.; and Adams, Harry A., 5,068,027, Cl. 208-125.000.

ADC Telecommunications, Inc.: *See—*
Henneberger, Roy L.; Weitnauer, Ronald M.; and Johnson, Wayne A., 5,067,678, Cl. 248-68.100.

Adelson, Alexander, to Intec Corp. Scanner detector array and light diffuser. 5,068,523, Cl. 250-208.100.

Aderer, Peter, to Lemmerz-Werke KGaA. Track adjustment wheel. 5,067,776, Cl. 301-9.0TV.

Adiwinata, Sofyan. Rotary internal combustion engine. 5,067,883, Cl. 418-61.200.

Adnrae, Franz: *See—*
Hesske, Benno; Adnrae, Franz; and Weber, Peter, 5,067,246, Cl. 33-555.400.

Advanced Chemical Technologies Company: *See—*
Brunken, Dean E.; and Hagen, Arnulf P., 5,068,132, Cl. 427-421.000.

Advanced Micro Devices: *See—*
Plants, William C.; and Fritz, Scott N., 5,068,830, Cl. 365-190.000.

Advanced Micro Devices, Inc.: *See—*
Newman, Robert A., 5,068,708, Cl. 357-68.000.

Aeci Limited: *See—*
Hemmings, John W.; Allan, Peter; and O'Shaughnessy, Gerald M., 5,067,972, Cl. 55-40.000.

AEG Olympia Aktiengesellschaft: *See—*
Kreutzburg, Franz; and Galleck, Kurt-G., 5,068,824, Cl. 395-800.000.

Aerazur: *See—*
Bac, Jean-Claude, 5,067,690, Cl. 251-149.800.

Aeroquip Corporation: *See—*
Maiville, Randolph L.; and Rogers, Russell L., 5,067,752, Cl. 285-119.000.

Aerospace Corporation, The: *See—*
Mirels, Harold; Spencer, Donald J.; and Hofland, Robert, Jr., 5,067,801, Cl. 359-666.000.

AFD Systems, Inc.: *See—*
Scherk, Randall P.; and Steneker, Daniel J., 5,068,888, Cl. 379-100.000.

Afflerbaugh, Martin G.: *See—*
Knox, George J.; Cronch, Daniel F.; and Afflerbaugh, Martin G., 5,067,910, Cl. 439-402.000.

Agata, Mitsuzi: *See—*
Inukai, Sinji; Agata, Mitsuzi; Umezawa, Manami; Horio, Yoshihiro; Ootake, Yasuhiro; Sawaki, Shohei; and Goto, Masayoshi, 5,068,239, Cl. 514-381.000.

AGFA-Gevaert, N.V.: *See—*
Coppens, Paul J.; Vervloet, Ludovicus H.; Leenders, Luc H.; and Schuerwegen, Ronald, 5,068,165, Cl. 430-204.000.

Agger, Reginald T.; Taylor, John R.; and Hardy, Alan, to Bostik, Inc. Sheet materials. 5,068,143, Cl. 428-241.000.

Agou, Tokinori: *See—*
Tanaka, Masahide; Agou, Tokinori; Kuwahara, Masahiro; Sakashita, Takeshi; Shimoda, Tomoaki; and Sudou, Masaru, 5,068,400, Cl. 560-223.000.

Agrawal, Rakesh; Farrell, Brian E.; and Wilson, Keith B., to Air Products and Chemicals, Inc. Cryogenic process for the production of an oxygen-free and methane-free, krypton/xenon product. 5,067,976, Cl. 62-22.000.

Agro-Kanesho Co., Ltd.: *See—*
Tokunaga, Takumi; Watanabe, Hiroyuki; Tsuzuki, Kenji; Someya, Sinzo; Koura, Seigo; and Ito, Mikio, 5,068,365, Cl. 549-496.000.

Ahman, Jan-Olov L., to Olsson, Clas Ove. Method and arrangement for pumping refrigerants. 5,067,325, Cl. 62-77.000.

Air Products and Chemicals, Inc.: *See—*
Agrawal, Rakesh; Farrell, Brian E.; and Wilson, Keith B., 5,067,976, Cl. 62-22.000.
Burgoyne, William F., Jr.; and Dixon, Dale D., 5,068,435, Cl. 564-409.000.
Bushinsky, Joseph P.; Nicholas, David M.; Wang, Shoou-I; and Patel, Nitin M., 5,068,058, Cl. 252-376.000.
Schweighardt, Frank K.; and Rubertone, Joseph A., 5,068,098, Cl. 424-9.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Kano, Junichi; Aoki, Kongoh; Mochizuki, Masahiro; and Nakadozono, Hiroyuki, 5,067,450, Cl. 123-90.170.
Kokubo, Kouichi; Tagawa, Shinichi; Kawanishi, Masaki; Sato, Kunihito; Buma, Shuuichi; Yonekawa, Takashi; and Aburaya, Toshio, 5,067,743, Cl. 280-707.000.

Aizawa, Takao: *See—*
Isobe, Kazuyuki; Aizawa, Takao; Yamaguchi, Noboru; and Ueda, Yutaka, 5,068,270, Cl. 524-68.000.

Akada, Masanori: *See—*
Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 5,068,282, Cl. 525-61.000.

Akado, Hajime: *See—*
Okajima, Atsushi; Yamazaki, Yasuou; Okamoto, Yasuhide; Nozawa, Masaei; Takeuchi, Yukihisa; and Akado, Hajime, 5,067,455, Cl. 123-196.00R.

Akamatsu, Akira: *See—*
Kurita, Yoshio; and Akamatsu, Akira, 5,068,206, Cl. 437-220.000.

Akashi, Hiroshi. Non-contact conveying device. 5,067,762, Cl. 294-64.300.

Akatsu, Masahiro; Takayama, Hajime; and Matsuoka, Takeshi, to Kureha Kagaku Kogyo K.K. Method for producing diarylmethanes. 5,068,481, Cl. 585-426.000.

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Akebono Brake Industry Co., Ltd.: *See*—
Maehara, Toshifumi, 5,067,881, Cl. 417-498.000.
Shirata, Akihiro; Watanabe, Hideaki; Hagiya, Naoyuki; Ookubo, Satomi; and Moride, Shigeki, 5,067,578, Cl. 180-197.000.

Akebono Research and Development Center Ltd.: *See*—
Maehara, Toshifumi, 5,067,881, Cl. 417-498.000.

Akebono Research and Development Centre Ltd.: *See*—
Shirata, Akihiro; Watanabe, Hideaki; Hagiya, Naoyuki; Ookubo, Satomi; and Moride, Shigeki, 5,067,578, Cl. 180-197.000.

Akhalaya, Mikail G.: *See*—
Gudov, Vasily F.; Yakhontov, Nikolai E.; Kharchenko, Vladimir P.; Dolotov, Boris K.; Belousov, Evgeny L.; Vinitsky, Valery B.; Kozlov, Alexandr M.; Akhalaya, Mikail G.; Koveshinikov, Alexandr D.; and Pugachev, Valery F., 5,067,952, Cl. 606-28.000.

Akhavan-Jaffi, Hashem: *See*—
Schaap, Arthur P.; and Akhavan-Jaffi, Hashem, 5,068,339, Cl. 548-110.000.

Akhtar, Muhammad; and Newell, Florine, to Johnson Products Co., Inc. Hair relaxer cream. 5,068,101, Cl. 424-71.000.

Akita Electronics Co., Ltd.: *See*—
Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, 5,068,828, Cl. 365-189.010.

Akiyama, Shigeyuki: *See*—
Suzuki, Riichiro; Akiyama, Shigeyuki; and Kubo, Yoshihiro, 5,067,814, Cl. 356-339.000.

Akram, Mustafa; and Seidel, Winfried, to 501 Hans Schwarzkopf GmbH. Nitro-p-phenylenediamine derivatives, processes for their preparation and coloring agents containing these for use on keratin fibres. 5,067,967, Cl. 8-415.000.

Aktiebolaget Hassle: *See*—
Andersson, Kjell H., 5,068,272, Cl. 524-155.000.

A.G. International Chemical Company, Inc.: *See*—
Okumura, Hiroyuki; Kurokawa, Masashi; Namikawa, Akira; and Tanisake, Hiroka, 5,068,281, Cl. 524-753.000.

Akzo N.V.: *See*—
Aschauer, Martin N., 5,068,092, Cl. 422-253.000.
Diamantoglou, Michael, 5,068,269, Cl. 524-35.000.
Driscoll, Richard C., 5,068,181, Cl. 435-13.000.
Pennings, Albert J.; and Roukema, Mees, 5,068,073, Cl. 264-205.000.
Telschow, Jeffrey E., 5,068,426, Cl. 564-15.000.

Alazet, Jean. Suction device with a squeegee for eliminating dirty water while cleaning certain surfaces. 5,067,199, Cl. 15-320.000.

Albarella, James P.; and Lin, Nan-Horng, to Miles Inc. Semi-conducting oligomers and method relating thereto. 5,068,355, Cl. 548-527.000.

Albizzati, Enrico; Morini, Giampiero; Giannini, Umberto; Barino, Luisa; Scordamaglia, Raimondo; Barbe, Pier C.; and Noristi, Luciano, to Himmont Incorporated. Components and catalysts for the polymerization of olefins. 5,068,213, Cl. 502-126.000.

Alcatel Espace: *See*—
Bouzat, Charles, 5,067,672, Cl. 244-158.00R.

Alcatel N.V.: *See*—
Rabaey, Dirk H. L. C.; and Haspeslagh, Didier R., 5,068,848, Cl. 370-85.600.
Walker, Michael, 5,068,903, Cl. 381-96.000.

Alden Products Company: *See*—
Behning, Christian D., 5,067,909, Cl. 439-315.000.

Aldrich Chemical Company, Inc.: *See*—
Brown, Herbert C., 5,068,432, Cl. 564-347.000.

Alexander, Elmore. Multi-level suspended garment holder. 5,067,621, Cl. 211-117.000.

Alfonsi, Eric A.: *See*—
Kline, Todd A.; Rosen, Warren A.; Berningham, William J.; and Alfonsi, Eric A., 5,068,880, Cl. 375-116.000.

Alfred Teves GmbH: *See*—
Belart, Juan, 5,067,779, Cl. 303-114.0PN.
Lauer, Peter, 5,067,365, Cl. 74-501.50R.
Leidecker, Hans-Dieter; Schmidt, Bodo; Krause, Helmut; and Dobener, Karl-Heinz, 5,067,594, Cl. 188-73.350.
Weiler, Rolf; Bach, Uwe; and Ceylan, Ahmet D., 5,067,595, Cl. 188-73.450.

Allan, Jonathan S.: *See*—
Essex, Myron E.; Allan, Jonathan S.; and Lee, Tun-Hou, 5,068,174, Cl. 435-5.000.

Allan, Peter: *See*—
Hemmings, John W.; Allan, Peter; and O'Shaughnessy, Gerald M., 5,067,972, Cl. 55-40.000.

Allandrieu, Christian: *See*—
Gubelmann, Michel; Rochin, Christophe; and Allandrieu, Christian, 5,068,391, Cl. 560-25.000.

Allegra, Carmen: *See*—
Kovacs, Joseph; Masur, Henry; and Allegra, Carmen, 5,068,253, Cl. 514-553.000.

Allen, L. Scott; Mills, William R.; and Stromswold, Daivd C., to Mobil Oil Corporation. Method and apparatus for producing a porosity log of a subsurface formation corrected for detector standoff. 5,068,531, Cl. 250-269.000.

Allen, Mark D.: *See*—
Pennell, Phillip E.; Blackmore, John M.; and Allen, Mark D., 5,068,225, Cl. 514-57.000.

Allen, Timothy P.: *See*—
Mead, Carver A.; and Allen, Timothy P., 5,068,622, Cl. 330-253.000.

Allergan, Inc.: *See*—
Chandraratna, Roshantha A. S., 5,068,252, Cl. 514-543.000.

Allied Plastics, Inc.: *See*—
Short, Edward H., III, 5,067,530, Cl. 141-98.000.

Allied-Signal Inc.: *See*—
Ball, Larry K.; Hines, Marshall U.; and Tervo, John N., 5,067,506, Cl. 137-1.000.
Chang, Chin-Hsiung, 5,068,037, Cl. 210-638.000.
Hinton, Mark L.; and Belka, John C., Jr., 5,068,647, Cl. 340-734.000.
Hirchert, Richard A., 5,067,349, Cl. 73-472.000.
Jen, Kwan-Yue A.; Elsenbaumer, Ronald L.; and Shacklette, Lawrence W., 5,068,060, Cl. 252-500.000.
Johannesen, Donald D., 5,067,596, Cl. 188-79.540.
Murugan, Muthu K., 5,068,557, Cl. 310-90.000.
Nelson, Charles J.; Bheda, Jayendra H.; Rim, Peter B.; and Turner, James M., 5,067,538, Cl. 152-451.000.

Allison, A. Christopher: *See*—
Jaffe, Richard A.; and Allison, A. Christopher, 5,067,942, Cl. 604-110.000.

Allison, Debra L.: *See*—
Tischler, Allan N.; Durette, Philippe L.; Witzel, Bruce E.; Rupprecht, Kathleen M.; Gallagher, Timothy F.; Goldenberg, Marvin M.; and Allison, Debra L., 5,068,248, Cl. 514-443.000.

Alonso, Carlos: *See*—
Bruckert, William; Kovalcin, David; Bissett, Thomas D.; Munzer, John; Mazur, Dennis; Mott, Peter R., Jr.; Dearth, Glenn A.; Alonso, Carlos; and Katan, Ann, 5,068,780, Cl. 395-700.000.

Alps Electric Co., Ltd.: *See*—
Kuratani, Junichi, 5,068,499, Cl. 200-6.00A.
Maeda, Takuya, 5,068,633, Cl. 335-190.000.

Alscher, Edbert. Thermal expansion compensation pendulum. 5,067,808, Cl. 352-140.000.

Alsenz, Richard H. Method and apparatus for controlling capacity of a multiple-stage cooling system. 5,067,326, Cl. 62-193.000.

Aluminum Company of America: *See*—
Nigro, William A.; and O'Neill, Gary A., 5,068,095, Cl. 423-122.000.

AM International Incorporated: *See*—
Gadway, Jeffrey G.; and Bryson, Robert, Sr., 5,067,699, Cl. 270-55.000.

Amada Company, Limited: *See*—
Ohnishi, Kenji; Washio, Isomi; and Nakano, Koji, 5,067,381, Cl. 83-820.000.

Ambu International A/S: *See*—
Kohnke, Ole B., 5,067,707, Cl. 272-99.000.

American Cast Iron Pipe Company: *See*—
Walworth, Van T.; and DeBoalt, Steve L., 5,067,751, Cl. 285-105.000.

American Cyanamid Company: *See*—
Kazan, John; and Kelly, James J., 5,068,437, Cl. 564-417.000.
Kuhn, David G.; and Kremer, Kenneth A. M., 5,068,390, Cl. 558-461.000.
Ziegler, Carl B., Jr.; Curran, William V.; and Feigelson, Gregg, 5,068,232, Cl. 514-210.000.

American Home Products Corporation: *See*—
Malamas, Michael S., 5,068,332, Cl. 546-18.000.
Zask, Arie; and Jirkovsky, Ivo, 5,068,342, Cl. 548-183.000.

American Orthodontics Corporation: *See*—
Tuneberg, Lee H., 5,067,897, Cl. 433-8.000.

American Recreation Products, Inc.: *See*—
Cantwell, Robert R.; and Zumsteg, Deborah M., 5,067,505, Cl. 135-104.000.

American Standard Inc.: *See*—
Carey, Michael D.; Smiley, William A., III; and Jansky, Gerald A., 5,067,560, Cl. 165-124.000.

American Sterilizer Company: *See*—
Childers, Robert W., 5,068,087, Cl. 422-26.000.

Ammermann, Eberhard: *See*—
Zipplies, Matthias; Sauter, Hubert; Roehl, Franz; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 5,068,245, Cl. 514-429.000.
Zipplies, Matthias; Sauter, Hubert; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 5,068,246, Cl. 514-429.000.

Amoco Corporation: *See*—
Bathe, Oscar M., 5,068,395, Cl. 560-90.000.
Eaton, Bruce E., 5,068,490, Cl. 585-525.000.
Holzhauer, Juergen K.; Brown, Albert P.; and Reeve, Aubrey C., 5,068,406, Cl. 562-413.000.
Moretta, Jon C.; and Gombas, Robert D., Jr., 5,068,024, Cl. 208-13.000.

Amorim, Osvaldo: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

AMP Incorporated: *See*—
Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,067,916, Cl. 439-857.000.
Egner, Walter A.; Schaffer, Ronald R.; Stauffer, Larry R.; and Warner, Gary N., 5,067,226, Cl. 29-452.000.
Sagawa, Tetsuya, 5,067,913, Cl. 439-595.000.
Analysist Development Group, Inc.: *See*—
Pipella, Lawrence S.; Fanjoy, Logan M.; Lawless, Rodger L.; and Davies, James E., 5,068,787, Cl. 364-406.000.
Ancrenaz, Daniel M., to Etablissements Balbinot S.A. Vibrating table installation for the manufacture of concrete products. 5,067,358, Cl. 74-61.000.
Anderson, Michael L. Coffee filter dispenser. 5,067,627, Cl. 221-36.000.
Anderson, Rolf: *See*—
Lindskog, Carl G.; Anderson, Rolf; and Loovv, Christer, 5,068,005, Cl. 156-514.000.
Andersson, Helge, to Tetra Pak Holdings S.A. Apparatus for forming packaging material into a tube. 5,067,311, Cl. 53-551.000.
Andersson, Kjell H., to Aktiebolaget Hassle. Novel polystyrenesulfonate, useful against cardiac arrhythmias. 5,068,272, Cl. 524-155.000.
Andersson, Morgan, to Robur Maskin AB. Seed-dispensing apparatus. 5,067,421, Cl. 111-36.000.
Ando, Minato; Kato, Takashi; Aoki, Hideyasu; Mizushima, Yasuyuki; Okura, Tsunetoshi; and Kurokawa, Akemi, to NGK Spark Plug Company, Ltd. Method and apparatus for concentration measurement by the quantity, diameter and convergent of a transmitted light beam. 5,068,542, Cl. 250-573.000.
Andoh, Masakazu: *See*—
Kosugi, Hiromitsu; Otani, Shinichi; Kashino, Teruo; Andoh, Masakazu; Arai, Takeo; and Nagashima, Toshiharu, 5,068,681, Cl. 354-299.000.
Andre, Jean-Luc, to Lohr Industrie, S.A. Unitary carrying assembly or unit for motor-car trailer vehicles. 5,067,862, Cl. 410-26.000.
Andree, Roland; Haug, Michael; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal (hetero)aryloxynaphthalene derivatives and intermediates therefor. 5,068,394, Cl. 560-56.000.
Andrews, Herbert L.: *See*—
Popovitch, Dragolyoub; and Andrews, Herbert L., 5,067,405, Cl. 102-232.000.
Androscore Corporation: *See*—
Ericsson, Ronald J.; and Ericsson, Scott A., 5,068,089, Cl. 422-61.000.
Anezaki, Takashi: *See*—
Kubota, Hitoshi; Yamane, Manabu; and Anezaki, Takashi, 5,068,588, Cl. 318-640.000.
Anjo, Ichiro: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.
ANT Nachrichtentechnik GmbH: *See*—
Gockler, Heinz, 5,068,817, Cl. 364-724.160.
Aoki, Hideyasu: *See*—
Ando, Minato; Kato, Takashi; Aoki, Hideyasu; Mizushima, Yasuyuki; Okura, Tsunetoshi; and Kurokawa, Akemi, 5,068,542, Cl. 250-573.000.
Aoki, Kongoh: *See*—
Kano, Junichi; Aoki, Kongoh; Mochizuki, Masahiro; and Nakadozono, Hiroyuki, 5,067,450, Cl. 123-90.170.
Aoki, Masaki: *See*—
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Aoki, Riichirou: *See*—
Egawa, Hidemitsu; Aoki, Riichirou; and Okumura, Katsuya, 5,068,709, Cl. 357-71.000.
Aoyama, Yoshitaka. Parts supplying apparatus. 5,067,763, Cl. 294-65.500.
Apollo B.V.: *See*—
Van Dijk, Dick, 5,067,312, Cl. 53-556.000.
Apple Computer, Inc.: *See*—
Batson, James; Beernink, Ernie; Fung, David; Potel, Michael; Cabral, Art; and Clark, Cary, 5,068,644, Cl. 340-701.000.
Appleton Electric Company: *See*—
Bolante, Jay J., 5,068,494, Cl. 174-65.0SS.
Applied Imaging Corporation: *See*—
Rutherford, Hal; and Taub, Floyd, 5,068,909, Cl. 382-49.000.
Applied Power Inc.: *See*—
Patel, Kishor J.; and Stobbs, Thomas J., 5,067,687, Cl. 251-129.080.
Applied Technology Associates, Inc.: *See*—
Laughlin, Darren R., 5,067,351, Cl. 73-516.0LM.
Appriou, Alain; Barthelemy, Regis; and Coulombeix, Colette, to Societe Nationale Industrielle et Aerospatiale. Method and device for recognizing a target. 5,068,664, Cl. 342-90.000.
APTI, Inc.: *See*—
Koert, Peter; and Cha, James T., 5,068,669, Cl. 343-700.0MS.
Aqua-Lawn, Inc.: *See*—
Toth, Louis, 5,068,773, Cl. 362-386.000.
Arabori, Noboru: *See*—
Tanaka, Masakatsu; Itoh, Masanobu; Arabori, Noboru; Nara, Toshihiko; Takahashi, Tastuhiko; Masuda, Katutaro; and Saito, Mitsuo, 5,067,593, Cl. 187-73.000.
Arai, Hiroyuki: *See*—
Nagasawa, Naobumi; and Arai, Hiroyuki, 5,068,856, Cl. 371-37.500.
Arai, Hitoshi: *See*—
Kanda, Yutaka; Kasai, Masaji; Arai, Hitoshi; Morimoto, Makoto; and Ashizawa, Tadashi, 5,068,349, Cl. 548-418.000.
Arai, Minoru, to Isuzu Motors Limited. Regeneration system for particulate trap. 5,067,318, Cl. 60-286.000.
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Kosugi, Hiromitsu; Otani, Shinichi; Kashino, Teruo; Andoh, Masakazu; Arai, Takeo; and Nagashima, Toshiharu, 5,068,681, Cl. 354-299.000.
Arai, Toshikazu: *See*—
Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, 5,068,828, Cl. 365-189.010.
Arai, Yasuhisa: *See*—
Sakai, Ichiro; Arai, Yasuhisa; Yamamoto, Masataka; and Matsui, Hiroki, 5,067,374, Cl. 74-866.000.
Araki, Mamoru: *See*—
Matsumoto, Etsuji; Araki, Mamoru; and Ozaki, Keiichi, 5,067,905, Cl. 439-76.000.
Araki, Shigeharu, to Sharp Kabushiki Kaisha. Facsimile recording apparatus with page cutting or continuous feed mode depending on mode setting or on number of pages to be received. 5,068,743, Cl. 358-304.000.
Araki, Toshimitsu; Kawamata, Fumihiko; Ogino, Masayuki; Miyagawa, Hitoshi; Kamata, Toshio; Watanabe, Mitsuo; and Miyashita, Kunihiro, to Ishikawajima-Harima Heavy Industries Co., Ltd. Screen forming apparatus and method. 5,067,653, Cl. 239-18.000.
Aramaki, Takanori: *See*—
Kaji, Masashi; Aramaki, Takanori; Nakahara, Norito; and Yamada, Yasuharu, 5,068,293, Cl. 525-534.000.
Arashi, Norio: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.
Archibald, John L.; Ward, Terence J.; and Opalko, Albert, to John Wyeth & Brother LImited. 1,4-dihydropyridines and their ability to inhibit blood platelet aggregation, inhibit thromboxane synthetase and phospholipase. 5,068,337, Cl. 514-256.000.
Arima, Hidetoshi, to Tokai Kogyo Kabushiki Kaisha. Weather strip and apparatus and process for manufacturing the same. 5,067,280, Cl. 49-498.000.
Arison, Byron H.: *See*—
Wyvratt, Matthew J., Jr.; Beattie, Thomas R.; Ok, Hyun; Arison, Byron H.; and Fisher, Michael H., 5,068,323, Cl. 540-456.000.
Arlt, Dieter; Bader, Axel; and Eckhardt, Volker, to Bayer Aktiengesellschaft. Bifunctional stilbene compounds containing at least one Z-configurated stilbene group, process for their preparation and their use for the preparation of polymers. 5,068,300, Cl. 526-318.200.
Array Analysis, Inc.: *See*—
Stark, William D.; and Prestas, Gregory C., 5,068,814, Cl. 364-580.000.
Arretz, Emmanuel, to Societe Nationale Elf Aquitaine (Production). Process for the preparation of organic disulphides and polysulphides. 5,068,445, Cl. 568-21.000.
Asada, Kenichirou: *See*—
Yoshida, Yoshiki; and Asada, Kenichirou, 5,068,676, Cl. 346-108.000.
Asahi Chemical Polyflex Co., Ltd.: *See*—
Umezawa, Kazumi, 5,067,306, Cl. 53-412.000.
Asahi Glass Company, Ltd.: *See*—
Higuchi, Toshihiko; Nakano, Yasuhiko; Kunii, Nobuaki; Yamaguchi, Yoshiyuki; and Kozawa, Shigeyuki, 5,068,304, Cl. 528-28.000.
Kumai, Seisaku; Yokokoji, Osamu; and Tamaoki, Akihiro, 5,068,449, Cl. 568-335.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro; and Sato, Osamu, 5,068,680, Cl. 354-286.000.
Mogamiya, Makoto; and Morisawa, Tahei, 5,068,678, Cl. 354-199.000.
Morimoto, Akira; and Iizuka, Takashi, 5,067,782, Cl. 359-202.000.
Tanaka, Akihiro, 5,068,844, Cl. 369-44.160.
Asahina, Kenichi: *See*—
Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 5,068,282, Cl. 525-61.000.
Asakawa, Minoru: *See*—
Soma, Utami; Koseki, Yasufumi; and Asakawa, Minoru, 5,068,853, Cl. 371-16.300.
Aschaber, Hans; Bailer, Rudolf; Fochler, Fritz; Kleinstauber, Bernd; and Ruf, Reinhold, to Uhlmann Pac-Systeme GmbH & Co. KG. System for erecting cartons. 5,067,937, Cl. 493-310.000.
Aschauer, Martin N., to Akzo N.V. Crystallizer, process and apparatus for producing sodium chloride crystals. 5,068,092, Cl. 422-253.000.
Asea Brown Boveri Ltd.: *See*—
Blangetti, Francisco; Muri, Werner; and Youssef, Mustafa, 5,067,446, Cl. 122-441.000.
Fried, Reinhard; and Jongenburger, Peter, 5,067,986, Cl. 148-11.50N.
Ashina, Yoshiro; Fujita, Takeyuki; Niwa, Kiyonobu; Inagaki, Takeshi; and Nikaido, Yuko, to Nitto Kagaku Kogyo Kabushiki Kaisha. Method for maintaining the activity of zeolite catalysts. 5,068,442, Cl. 564-479.000.

Ashizawa, Tadashi: *See*—
Kanda, Yutaka; Kasai, Masaji; Arai, Hitoshi; Morimoto, Makoto; and Ashizawa, Tadashi, 5,068,349, Cl. 548-418.000.

Ashland Oil Inc.: *See*—
Hays, George F.; and Coyle, James A., 5,068,196, Cl. 436-6.000.

Askonas, Leslie J.: *See*—
Penning, Trevor M.; and Askonas, Leslie J., 5,068,250, Cl. 514-506.000.

Asta Pharma Aktiengesellschaft: *See*—
Achterrath-Tuckerman, Ute; Aurich, Rudolf; Engel, Jurgen; Hettche, Helmut; and Kleeman, Axel, 5,068,233, Cl. 514-212.000.

Aster Corporation: *See*—
Gillham, Frederick J.; and Stowe, David W., 5,067,787, Cl. 385-50.000.

AT&T Bell Laboratories: *See*—
Deppe, Dennis G.; Feldman, Leonard C.; Kopf, Rose F.; Schubert, Erdmann F.; Tu, Li Wei; and Zydzik, George J., 5,068,868, Cl. 372-45.000.
Lampert, Norman R., 5,067,783, Cl. 385-60.000.
Livanos, Konstantin, 5,068,892, Cl. 379-221.000.
Manocha, Ajit S.; and Yu, Chen-Hua D., 5,068,207, Cl. 437-231.000.
Near, Christopher D.; and Uyar, M. Umit, 5,068,877, Cl. 375-107.000.
Tsai, Sheng-Jen, 5,068,657, Cl. 341-120.000.
Vince, Richard A., 5,068,631, Cl. 333-181.000.

Atlantic Richfield Company: *See*—
Baillie, Lloyd A., 5,067,252, Cl. 34-57.00A.

Atlantis Energie AG: *See*—
Posnansky, Mario, 5,067,475, Cl. 126-418.000.

Atochem North America, Inc.: *See*—
Sandler, Stanley R.; Schon, Steven G.; and Gardner, David M., 5,068,427, Cl. 564-84.000.
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Atsugi Motor Parts Company Limited: *See*—
Kawasaki, Isamu; and Hirata, Kazunari, 5,067,393, Cl. 92-186.000.

Attinger, Thomas; and Plonus, Frank, to Mercedes-Benz AG. Mounting for a cooler. 5,067,574, Cl. 180-68.400.

Atwood Industries, Inc.: *See*—
Marchione, Joseph H., 5,067,201, Cl. 16-270.000.
Nudd, Barry C.; and Chambers, James W., 5,067,692, Cl. 254-420.000.

Aubry, Friedhelm, to TRW Nelson BolzenschweiB-Technik GmbH & Co. KG. Device for the individual feeding of studs or bolts. 5,067,632, Cl. 221-266.000.

Augenstein, Don C.: *See*—
Wise, Donald L.; Augenstein, Don C.; and Gresser, Joseph D., 5,068,188, Cl. 435-140.000.

Auger, Ronald Y. Fluid applicator for hair conditioning. 5,067,501, Cl. 132-116.000.

Aur, Shian: *See*—
Yang, Ping; Chatterjee, Amitava; Aur, Shian; and Polgreen, Thomas L., 5,068,696, Cl. 357-23.100.

Aurich, Rudolf: *See*—
Achterrath-Tuckerman, Ute; Aurich, Rudolf; Engel, Jurgen; Hettche, Helmut; and Kleeman, Axel, 5,068,233, Cl. 514-212.000.

Aurness, Harold O.; and Jones, Tony L. Canteen bottle for dispensing rationed drinks. 5,067,637, Cl. 222-175.000.

Ausimont, S.r.l: *See*—
Tonelli, Claudio; and Torelli, Vito, 5,068,470, Cl. 570-134.000.

Ausimont S.p.A.: *See*—
Zavatteri, Ignazio; and Gambini, Tiziana, 5,068,135, Cl. 427-439.000.

Auslander, Klaus; Fabris, Hans-Jurgen; Mock, Karl-Heinz; Patwald, Wolfgang; and Seichter, Helmut, to Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG. Electromagnetic shield for an inductive search coil assembly. 5,068,612, Cl. 324-327.000.

Autogenesis Technologies, Inc.: *See*—
Kelman, Charles D.; and DeVore, Dale P., 5,067,961, Cl. 623-5.000.

Automatic Truck Loading Systems (Europe) Ltd. and Bridon plc: *See*—
McLellan, William, 5,067,608, Cl. 198-817.000.

Auweiler, Willi; Solbach, Bernd; and Luetzeler, Robert, to Ford Motor Company. Device for measurement of gap and flush. 5,067,250, Cl. 33-783.000.

Avco Corporation: *See*—
Waddington, Clive; Lagasse, Normand L.; and Taupier, Roger, 5,067,454, Cl. 123-196.00S.

Aware, Inc.: *See*—
Resnikoff, Howard L.; and Zettler, William, Jr., 5,068,911, Cl. 382-56.000.

Axelson, Inc.: *See*—
Breaux, Craig B.; Cawyer, Denny; Duplantis, Dwight; and Hiller, Don, 5,067,510, Cl. 137-77.000.

Ayers, Glenn. Baby bidet apparatus with retraction and height adjustment means. 5,067,186, Cl. 4-665.000.

Ayme, Jacques, to A.C.T.M. Devices using a dolly for reinforcing the loading capacity of tractor vehicles. 5,067,741, Cl. 280-419.000.

Azechi, Syuuichi: *See*—
Meguriya, Noriyuki; Azechi, Syuuichi; and Tanaka, Masaki, 5,068,380, Cl. 556-428.000.

Azuhata, Shigeru: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Azukizawa, Teruo: *See*—
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B-Line Systems, Inc.: *See*—
Kowalski, Joseph W., 5,067,863, Cl. 411-85.000.

Baba, Tsuyoshi, to Canon Kabushiki Kaisha. Part isolating apparatus. 5,067,631, Cl. 221-254.000.

Babbitt, Richard W.; Rachlin, Adam; and Koscica, Thomas E., to United States of America, Army. Narrow band microstrip isolator. 5,068,627, Cl. 331-99.000.

Babcock & Wilcox Company, The: *See*—
Connolly, Dennis J., 5,068,090, Cl. 422-82.020.

Bac, Jean-Claude, to Aerazur. Self-closing device for connecting containers. 5,067,690, Cl. 251-149.800.

Bach, Uwe: *See*—
Weiler, Rolf; Bach, Uwe; and Ceylan, Ahmet D., 5,067,595, Cl. 188-73.450.

Bachmann, Peter K.; Khoe, Giok D.; Mahon, Cathal J.; and Lydtin, Hans-Jurgen, to U.S. Philips Corporation. Polarization-maintaining single-mode optical fibre and method of making same. 5,067,793, Cl. 385-127.000.

Backer, Marcella R.; Cavender, Ralston; Elder, Melanie L.; Jones, Peter C.; and Murphy, James A., to Corning Incorporated. Method of manufacturing optical waveguide fiber with titania-silica outer cladding. 5,067,975, Cl. 65-3.120.

Bacon, Edward R.: *See*—
D'Ambra, Thomas E.; Bacon, Edward R.; Bell, Malcolm R.; Carabateas, Philip M.; Eissenstat, Michael A.; Kumar, Virendra; Mallamo, John P.; and Ward, Susan J., 5,068,234, Cl. 514-235.200.

Bader, Axel: *See*—
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Bailer, Rudolf: *See*—
Aschaber, Hans; Bailer, Rudolf; Fochler, Fritz; Kleinstauber, Bernd; and Ruf, Reinhold, 5,067,937, Cl. 493-310.000.

Bailey, John M., to Caterpillar Inc. Fuel combustion system and method of operation for an Otto-cycle internal combustion engine. 5,067,458, Cl. 123-292.000.

Baillie, Lloyd A., to Atlantic Richfield Company. Method and apparatus to conduct fluidization of cohesive solids by pulsating vapor flow. 5,067,252, Cl. 34-57.00A.

Baker Hughes Incorporated: *See*—
Yates, Donald N., Jr.; and Myers, William D., Jr., 5,067,568, Cl. 175-4.520.

Baker, James C.; and Carney, Michael J., to Motorola, Inc. Method for fast frequency acquisition in a phase locked loop. 5,068,625, Cl. 331-1.00A.

Baker, John E. Anti-theft trailer jack and method of using same. 5,067,746, Cl. 280-763.100.

Baker, Stephen J., to U.S. Philips Corporation. Data display. 5,068,646, Cl. 340-725.000.

Baker, Walter J.; and Riello, Christopher S. System and method for controlling an apparatus to produce mail pieces in non-standard configurations. 5,067,305, Cl. 53-411.000.

Bakke, Paul D.: *See*—
Van Horne, Arthur C.; Hoffman, Eldon P.; and Bakke, Paul D., 5,067,705, Cl. 271-277.000.

Ball, Larry K.; Hines, Marshall U.; and Tervo, John N., to Allied-Signal Inc. Flight craft with fluid systems which incorporate butterfly valves, and butterfly valve methods and apparatus. 5,067,506, Cl. 137-1.000.

Ball, Richard F., to British Aerospace Public Limited Company. Weapon systems. 5,067,411, Cl. 102-489.000.

Balle, Anders H.: *See*—
Hansen, Sven K.; and Balle, Anders H., 5,068,121, Cl. 426-636.000.

Bally Manufacturing Corporation: *See*—
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Balser, Klaus: *See*—
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Balthazor, Terry M.: *See*—
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Balzer, Dieter; Reimer, Heinz; and Friedrich, Werner, to Huels Aktiengesellschaft. Carboxy ethers. 5,068,422, Cl. 562-587.000.

Ban, Takeshi; Matsunaga, Shigeru; Hirano, Hidemi; Isobe, Tuguo; and Takakura, Yoshio, to Nisshin Steel Co., Ltd.; and Hitachi, Ltd. Process and apparatus for continuous casting of metal strip. 5,067,555, Cl. 164-480.000.

Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., to R. J. Reynolds Tobacco Company. Smoking article. 5,067,499, Cl. 131-194.000.

Bannister, Eric: *See*—
Brownawell, Darrell W.; Thaler, Warren A.; Bannister, Eric; and Ladwig, Paul K., 5,068,044, Cl. 252-25.000.

Banura, George A., to United States of America, Navy. Internal grounding arrangement in a switching power converter. 5,068,596, Cl. 323-351.000.

Banyu Pharmaceutical Co., Ltd.: *See*—
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Bar-Lev, Menachem: *See—*
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Barbe, Pier C.: *See—*
Albizzati, Enrico; Morini, Giampiero; Giannini, Umberto; Barino, Luisa; Scordamaglia, Raimondo; Barbe, Pier C.; and Noristi, Luciano, 5,068,213, Cl. 502-126.000.
Barczak, John P.: *See—*
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Bard, John K.; and Burnier, Julia S., to Hercules Incorporated. Organosilicon materials. 5,068,303, Cl. 528-25.000.
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Albizzati, Enrico; Morini, Giampiero; Giannini, Umberto; Barino, Luisa; Scordamaglia, Raimondo; Barbe, Pier C.; and Noristi, Luciano, 5,068,213, Cl. 502-126.000.
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Barney, Charlotte L.: *See—*
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Barrack Technology Limited: *See—*
Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; Law, Robert W.; and Vincent, Michael T., 5,067,463, Cl. 123-425.000.
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Barre, Claude, to Siemens Aktiengesellschaft. ECL-TTL signal level converter. 5,068,550, Cl. 307-475.000.
Barron, J. Brian: *See—*
Reifschneider, Walter; Bisabri-Ershadi, Barat; Dripps, James E.; and Barron, J. Brian, 5,068,230, Cl. 514-115.000.
Barrows, Franklin H.: *See—*
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Barsotti, Robert; and Cohen, Lester S., to Du Pont de Nemours, E. I., and Company. Multi-component coating composition comprising an anhydride containing polymer, a glycidyl component and a phosphonium catalyst. 5,068,153, Cl. 428-413.000.
Bartek, Joseph P.; Brazdil, James F., Jr.; Hupp, John M.; and Grasselli, Robert K., to Standard Oil Company. Catalyst for upgrading low molecular weight hydrocarbons. 5,068,215, Cl. 502-208.000.
Barthelemy, Regis: *See—*
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Bartholomew, Donald D., to Propietary Technology, Inc. Swivelable quick connector assembly. 5,067,754, Cl. 285-319.000.
Barthomeuf, Denise; and de Quivillic, Viviane Q., to Centre National de la Recherche Scientifique; and Societe Nationale Elf Aquitaine. Catalysts based on zeolites modified by alkali metal elements in the metallic form, their preparation, and their application to alkylation of alkylaromatic derivatives. 5,068,483, Cl. 585-467.000.
Bartnicki, Frederick J., to R. D. Werner Co., Inc. Extendable support. 5,067,589, Cl. 182-223.000.
BASF Aktiengesellschaft: *See—*
Baur, Richard; Gousetis, Charalampos; Trieselt, Wolfgang; Bochnitschek, Werner; and Oftring, Alfred, 5,068,416, Cl. 562-571.000.
Huellmann, Michael; Mayr, Herbert; and Becker, Rainer, 5,068,479, Cl. 585-411.000.
Merger, Franz; Fischer, Rolf; Harder, Wolfgang; Priester, Claus-Ulrich; and Vagt, Uwe, 5,068,398, Cl. 560-156.000.
Pipper, Gunter; Heinz, Gerhard; and Hisgen, Bernd, 5,068,308, Cl. 528-171.000.
Richter, Wolfgang; Fischer, Rolf; and Vagt, Uwe, 5,068,361, Cl. 549-273.000.
Schossig, Juergen; Koppenhoffer, Gerhard; Irgang, Matthias; Schnur, Rudi; and Roley, George, 5,068,468, Cl. 568-861.000.
Zimmermann, Clifton; and Mumford, Glen, 5,068,862, Cl. 372-25.000.
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Zipplies, Matthias; Sauter, Hubert; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 5,068,246, Cl. 514-429.000.
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Batey, John; and Tierney, Elaine, to International Business Machines Corporation. Method for depositing high quality silicon dioxide by PECVD. 5,068,124, Cl. 427-39.000.
Bathe, Oscar M., to Amoco Corporation. Process for producing polymeric plasticizers from polyethylene terephthalate. 5,068,395, Cl. 560-90.000.
Batista, Altair R. D.: *See—*
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.
Batson, James; Beernink, Ernie; Fung, David; Potel, Michael; Cabral, Art; and Clark, Cary, to Apple Computer, Inc. Color graphics system. 5,068,644, Cl. 340-701.000.
Battelle Development Corporation: *See—*
Bosswell, Peter; Richter, Dag; Berce, Tatjana; and Negaty-Hindi, Guy, 5,067,554, Cl. 164-463.000.
Battelle Institut e.V.: *See—*
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Bauman, Jack. Resuscitator. 5,067,487, Cl. 128-205.130.
Baur, Richard; Gousetis, Charalampos; Trieselt, Wolfgang; Bochnitschek, Werner; and Oftring, Alfred, to BASF Aktiengesellschaft. Preparation of β-alaninediacetic acid or its alkali metal or ammonium salts. 5,068,416, Cl. 562-571.000.
Baur, Rupert; Durler, Egon; and Kilb, Hermann, to Mannesmann A.G. Expandable module frame for mounting printer and accessory modules. 5,067,832, Cl. 400-66.000.
Bausch & Lomb Incorporated: *See—*
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bautex Adolf Stoever Soehne KG: *See—*
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Baxter International Inc.: *See—*
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Kawahara, Masafumi; Bowman, George A.; and Matthews, Joseph B., 5,068,586, Cl. 318-696.000.
Baxter, Ronald D.; and Kroninger, Paul M., Jr., to General Signal Corporation. Header mounted chemically sensitive ISFET and method of manufacture. 5,068,205, Cl. 437-205.000.
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Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, 5,068,015, Cl. 204-89.000.
Degen, Bruno; Feldner, Kurt; Licht, Elke; and Wagner, Gebhard, 5,068,385, Cl. 556-472.000.
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Fuchs, Rainer; Erdelen, Christoph; Becker, Benedikt; and Stendel, Wilhelm, 5,068,241, Cl. 514-403.000.
Horlacher, Peter; Serini, Volker; Freitag, Dieter; Grigo, Ulrich; Idel, Karsten-Josef; and Westeppe, Uwe, 5,068,302, Cl. 528-21.000.
Horn, Klaus; Heinz, Hans-Detlef; Muller, Peter-Rolf; and Dujardin, Ralf, 5,068,311, Cl. 528-324.000.
Klug, Gunter; Buysch, Hans-Josef; and Puppe, Lothar, 5,068,434, Cl. 564-399.000.
Meixner, Jurgen; Clemens, Horst; and Sickert, Armin, 5,068,125, Cl. 427-55.000.
Meixner, Jurgen; Pedain, Josef; Hohlein, Peter; and Kreuder, Hans-Joachim, 5,068,305, Cl. 528-49.000.
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Bayer, Eric W., to General Electric Company. Plate-like metal element for electrical resistor grid assembly. 5,068,637, Cl. 338-57.000.
Bayer, Horst O.; Lange, Barry C.; and Petigara, Ramesh B., to Rohm and Haas Company. Process for nitrosamine-free sabilized isothiazolones. 5,068,338, Cl. 548-101.000.
Baziuk, Maurice W. Self-cleaning lens shield for headlights. 5,068,770, Cl. 362-61.000.
Beach, Wayne H.: *See—*
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Beachley, Norman H.; and Fronczak, Frank J. Hypocycloid engine. 5,067,456, Cl. 123-197.0AC.
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Becker, Gerald W.; and Riggin, Ralph M., to Eli Lilly and Company. Novel derivative of human growth hormone. 5,068,317, Cl. 530-399.000.

Becker, Rainer: *See—*
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Becker, Udo: *See—*
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Becton, Dickinson and Company: *See—*
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Beecham Group p.l.c.: *See—*
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Beele, Johannes A., to CSD International B.V. System for the prevention of fire, water or flue gas and the like from propagating along cables. 5,067,676, Cl. 248-56.000.

Beeley, Michael G., to Logan Manufacturing Company. Flexible rotary snow tiller. 5,067,264, Cl. 37-222.000.

Beernink, Ernie: *See—*
Batson, James; Beernink, Ernie; Fung, David; Potel, Michael; Cabral, Art; and Clark, Cary, 5,068,644, Cl. 340-701.000.

Beers, David G., to General Electric Company. Refrigerator with spine fin evaporator. 5,067,322, Cl. 62-515.000.

Beery, Jack. Apparatus for controlling a television receiver. 5,068,734, Cl. 358-191.100.

Behl, Klaus; Erren, Karl-Heinz; and Mantz, Ekkehard, to Norddeutsche Faserwerke GmbH. Automatic adjusting selvedge control device for a textile web using multiple sensors. 5,067,215, Cl. 28-190.000.

Behnam, Basil A.: *See—*
Vukov, Rastko; and Behnam, Basil A., 5,068,277, Cl. 524-441.000.

Behning, Christian D., to Alden Products Company. Locking multiple conductor electrical connector. 5,067,909, Cl. 439-315.000.

Behringwerke Aktiengesellschaft: *See—*
Paques, Eric P.; and Stohr, Hans-Arnold, 5,068,106, Cl. 424-94.300.

Beiersdorf AG: *See—*
Silbernagel, Hermann; and Wiegand, Ulfried, 5,067,849, Cl. 404-9.000.

Beisang, Arthur A.: *See—*
Ersek, Robert A.; Beisang, Arthur A.; and Beisang, Arthur A., III, 5,067,965, Cl. 623-66.000.

Beisang, Arthur A., III: *See—*
Ersek, Robert A.; Beisang, Arthur A.; and Beisang, Arthur A., III, 5,067,965, Cl. 623-66.000.

Bekhazi, Michel; and Oren, Josef, to Delmar Chemicals Inc. Famotidine intermediates and their preparation. 5,068,405, Cl. 562-83.000.

Belak, Maria: *See—*
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 5,068,424, Cl. 562-870.000.

Belart, Juan, to Alfred Teves GmbH. Braking pressure generator for a vacuum operated brake system with anit-lock control. 5,067,779, Cl. 303-114.0PN.

Belet, Francois: *See—*
Bourgeois, Michel; Chatelin, Roger; Wattiez, Daniel; Sotton, Michel; Belet, Francois; and Achard, Georges, 5,068,113, Cl. 424-496.000.

Belka, John C., Jr.: *See—*
Hinton, Mark L.; and Belka, John C., Jr., 5,068,647, Cl. 340-734.000.

Bell, Charles A.: *See—*
Heath, Warren J.; Langner, Rene J.; and Bell, Charles A., 5,068,798, Cl. 364-497.000.

Bell Communications Research, Inc.: *See—*
Fernandez, Antonio; Gaggioni, Hugo P.; Jaquez, Martin J.; Robbins, John D.; and Soper, E. Scott, 5,068,650, Cl. 340-799.000.
Patel, Jayantilal S., 5,068,749, Cl. 359-93.000.

Bell, Malcolm R.: *See—*
D'Ambra, Thomas E.; Bacon, Edward R.; Bell, Malcolm R.; Carabateas, Philip M.; Eissenstat, Michael A.; Kumar, Virendra; Mallamo, John P.; and Ward, Susan J., 5,068,234, Cl. 514-235.200.

Bell, Michael. Multipurpose safety and positioning belt. 5,067,585, Cl. 182-7.000.

Beloit Corporation: *See—*
Gangemi, Donald, 5,068,513, Cl. 219-121.670.

Belousov, Evgeny L.: *See—*
Gudov, Vasily F.; Yakhontov, Nikolai E.; Kharchenko, Vladimir P.; Dolotov, Boris K.; Belousov, Evgeny L.; Vinitsky, Valery B.; Kozlov, Alexandr M.; Akhalaya, Mikail G.; Koveshinikov, Alexandr D.; and Pugachev, Valery F., 5,067,952, Cl. 606-28.000.

Beltec International: *See—*
Liebermann, Benno E., 5,068,115, Cl. 426-77.000.

Beltz, Klaus: *See—*
Frankenfeld, Klaus; Beltz, Klaus; Eich, Gerhard; and Endrich, Klaus, 5,068,094, Cl. 423-109.000.

Benchoff, John R., to Benchoff, John Rex. Duct-way between a pickup truck cab and a bed cap, both with sliding glass windows. 5,067,769, Cl. 296-166.000.

Benchoff, John Rex: *See—*
Benchoff, John R., 5,067,769, Cl. 296-166.000.

Bender, Franz: *See—*
Panten, Detlef; Naber, Dirk; and Bender, Franz, 5,067,470, Cl. 123-568.000.

Bender, Glenn, to Shenandoah Manufacturing Co., Inc. Oil burner assembly. 5,067,894, Cl. 431-208.000.

Bendickson, Roy B., to R. D. Werner Co., Inc. Ladder lash. 5,067,588, Cl. 182-107.000.

Bendix Europe Services Techniques: *See—*
Gautier, Jean-Pierre, 5,067,392, Cl. 92-98.00D.

Benn, Robert C., Jr.: *See—*
Benn, Robert C., Sr.; and Benn, Robert C., Jr., 5,068,493, Cl. 174-35.0GC.

Benn, Robert C., Sr.; and Benn, Robert C., Jr., to Vanguard Products Corporation. Dual elastomer gasket shield for electronic equipment. 5,068,493, Cl. 174-35.0GC.

Bennett, Keith N.; and Pangretic, Richard H., Jr., to United Technologies Corporation. Three position actuator arrangement. 5,067,323, Cl. 60-734.000.

Bennett, Richard H. Multiple access television. 5,068,733, Cl. 358-181.000.

Bennorth, Gregory S.: *See—*
Swanson, Dail L.; Green, Raymond M.; and Bennorth, Gregory S., 5,068,639, Cl. 338-179.000.

Bentley, William F.: *See—*
Sexton, Daniel W.; and Bentley, William F., 5,068,821, Cl. 395-800.000.

Berce, Tatjana: *See—*
Bosswell, Peter; Richter, Dag; Berce, Tatjana; and Negaty-Hindi, Guy, 5,067,554, Cl. 164-463.000.

Berg, Peter G.: *See—*
Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 5,068,589, Cl. 322-7.000.

Bergeron, Marcel J. Sliding and locking system for a force applying structure on a vehicle straightening bench. 5,067,342, Cl. 72-447.000.

Berlant, Stephen R. Structure and method of manufacturing an electrode glove for applying electro-massage and electro-acupressure to patients. 5,067,478, Cl. 128-24.500.

Bermingham, William J.: *See—*
Kline, Todd A.; Rosen, Warren A.; Bermingham, William J.; and Alfonsi, Eric A., 5,068,880, Cl. 375-116.000.

Bernard, Bobby L.: *See—*
Sumner, Charles E., Jr.; Hitch, Brenda J.; and Bernard, Bobby L., 5,068,460, Cl. 568-648.000.

Bernards, Roger F.; Fischer, Gordon; and Sonnenberg, Wade, to Shipley Company Inc. Electroplating composition and process. 5,068,013, Cl. 204-24.000.

Berrebi, Georges, to Europeenne de Retraitement de Catalyseurs Eurecat. Process for reducing a refining catalyst and use of the catalyst hydrogenation. 5,068,477, Cl. 585-274.000.

Berry, Stephen R., to Molex Incorporated. Wire marking apparatus for marking selected codes onto any of a plurality of wires. 5,067,399, Cl. 101-11.000.

Bersonnet, George B.: *See—*
Watterson, Scott R.; Bersonnet, George B.; Dalebout, William T.; and Burk, Michael, 5,067,710, Cl. 272-129.000.

Berthold, James P.: *See—*
Kawate, Keith W.; Berthold, James P.; and Margolis, Robert M., 5,068,606, Cl. 324-174.000.

Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., to Nitrokemia Ipartelepek; and Magyar Tudomanyos Akademia Kozponti Kemiai Kutato Intezete. Process for preparing arylsulphonyl-isocyanates and addition derivatives thereof. 5,068,424, Cl. 562-870.000.

Besler, Armin. Combination window frame with roll-up shutter channels mounted on it and associated shutter housing. 5,067,540, Cl. 160-31.000.

Betterton, Kathleen M.; Hinsberg, William D.; Nguyen, Huu T.; Tang, Wing T.; and Twieg, Robert J., to International Business Machines Corporation. Ferroelectric liquid crystals. 5,068,054, Cl. 252-299.620.

Betts, James G. Brush gopher. 5,067,261, Cl. 37-2.00P.

Beyeler, Harry: *See—*
Steiner, Eginhard; Beyeler, Harry; and Husler, Rinaldo, 5,068,371, Cl. 556-53.000.

Beytes, Deane; and Lindstrom, Erik A., to United Technologies Corporation. Engine nozzle liner retainer. 5,067,324, Cl. 60-752.000.

Bezella, Gary L.; and Bezella, Steven T. Screen printing with an abrasive ink. 5,067,400, Cl. 101-129.000.

Bezella, Steven T.: *See—*
Bezella, Gary L.; and Bezella, Steven T., 5,067,400, Cl. 101-129.000.

BHA Group, Inc.: *See—*
Johnston, David F.; and Farmer, Terry L., 5,068,811, Cl. 364-551.010.

Bhan, Opindar K., to Shell Oil Company. Aromatics saturation process for diesel boiling-range hydrocarbons. 5,068,025, Cl. 208-57.000.

Bhattacharyya, Bhupati R.; and St. John, Michael R., to Nalco Chemical Company. Hydrophobic cationic terpolymers from acrylamide, unsaturated quaternary salt and vinyl acetate. 5,068,297, Cl. 526-287.000.

Bheda, Jayendra H.: *See—*
Nelson, Charles J.; Bheda, Jayendra H.; Rim, Peter B.; and Turner, James M., 5,067,538, Cl. 152-451.000.

Bhogal, Balbir S.; Williams, Michael G.; and Miller, Glenn A., to A. H. Robins Company Incorporated. Live vaccine for coccidiosis utilizing coccidial sporozoites. 5,068,104, Cl. 424-88.000.

Biancale, Vito. Tarpaulin cover. 5,067,767, Cl. 296-100.000.

BICC Public Limited Company: *See—*
Hawkins, Ronald G.; and Grigsby, Richard, 5,067,786, Cl. 385-13.000.

Bickel, Wayne J. Nock adapter. 5,067,731, Cl. 273-416.000.

Bickely, Alan C.; and Moore, Travis, to Gates Rubber Company, The. Electrical sensing element. 5,068,638, Cl. 338-114.000.

Bickford, Wayne F.; and Smith, Kenneth L., to M/A-Com Adams-Russell, Inc. Subassembly for a microwave connector and method for making it. 5,067,912, Cl. 439-578.000.

bielomatik Leuze GmbH & Co.: *See*—
Seefeldt, Joachim, 5,067,380, Cl. 83-481.000.

Bikson, Benjamin; Giglia, Salvatore; and Nelson, Joyce K., to Union Carbide Industrial Gases Technology Corporation. Process for dehydration of gases and composite permeable membranes therefor. 5,067,971, Cl. 55-16.000.

Binder, Margaret L. Cuff-like tubular extensions for wearing apparel. 5,067,177, Cl. 2-239.000.

Biomembrane Institute, The: *See*—
Clausen, Henrik; Yamamoto, Fumi-ichiro; White, Thayer; and Hakomori, Sen-itiroh, 5,068,191, Cl. 435-193.000.

Bioplasty, Inc.: *See*—
Ersek, Robert A.; Beisang, Arthur A.; and Beisang, Arthur A., III, 5,067,965, Cl. 623-66.000.

Bird Machine Company: *See*—
Shapiro, Ascher H., 5,067,939, Cl. 494-53.000.

Bisabri-Ershadi, Barat: *See*—
Reifschneider, Walter; Bisabri-Ershadi, Barat; Dripps, James E.; and Barron, J. Brian, 5,068,230, Cl. 514-115.000.

Bissett, Thomas D.: *See*—
Bruckert, William; Kovalcin, David; Bissett, Thomas D.; Munzer, John; Mazur, Dennis; Mott, Peter R., Jr.; Dearth, Glenn A.; Alonso, Carlos; and Katan, Ann, 5,068,780, Cl. 395-700.000.
Bruckert, William; Bissett, Thomas D.; Kovalcin, David; and Nene, Ravi, 5,068,851, Cl. 371-16.100.

BJ Services Company: *See*—
Dawson, Jeffrey C., 5,067,566, Cl. 166-308.000.

Bjerklund, Gunnar; Ore, William C.; Pulawski, Casimir; and Notardonato, Luigi, to Universal Beverage Equipment, Inc. Liquid proportioner apparatus and method. 5,067,507, Cl. 137-3.000.

Black & Decker Inc.: *See*—
Speer, Howard D.; and Shortt, Robert A., 5,067,887, Cl. 425-256.000.

Black, Lance L.: *See*—
Knobel, Thomas M.; McCullough, Francis P., Jr.; and Black, Lance L., 5,068,061, Cl. 252-511.000.

Blackmore, Geoffrey: *See*—
Davidson, Joseph W.; Blackmore, Geoffrey; Blackmore, Gerald; Komerek, Karl R., deceased; and Komerek, Richard, executor, 5,067,968, Cl. 44-550.000.

Blackmore, Gerald: *See*—
Davidson, Joseph W.; Blackmore, Geoffrey; Blackmore, Gerald; Komerek, Karl R., deceased; and Komerek, Richard, executor, 5,067,968, Cl. 44-550.000.

Blackmore, John M.: *See*—
Pennell, Phillip E.; Blackmore, John M.; and Allen, Mark D., 5,068,225, Cl. 514-57.000.

Blain, David A.; and Cardis, Angeline B., to Mobil Oil Corporation. Lubricant composition comprising an octadecylene oxide polyamine reaction product. 5,068,046, Cl. 252-51.50A.

Bland, Donald L.; and Smithers, Matthew C., to Thermalloy Incorporated. Electronic device package mounting assembly. 5,068,764, Cl. 361-386.000.

Blangetti, Francisco; Muri, Werner; and Youssef, Mustafa, to Asea Brown Boveri Ltd. Apparatus for degassing and heating water. 5,067,446, Cl. 122-441.000.

Blank, Heinz U.: *See*—
Diehl, Herbert; Blank, Heinz U.; and Ritzer, Edwin, 5,068,428, Cl. 564-134.000.

Blankers, Hendrik J., to U.S. Philips Corporation. Switch mode power supply. 5,068,572, Cl. 315-209.00R.

Blaum, Miguel M.; and Hao, Hsieh T., to International Business Machines Corporation. Error correction capability varied with track location on a magnetic or optical disk. 5,068,858, Cl. 371-41.000.

Bleier, Roger D.: *See*—
Patel, Arvind D.; McGlothlin, Raymond E.; Bleier, Roger D.; and Brinkley, H. N., 5,068,041, Cl. 507-103.000.

Bliss, Douglas: *See*—
Redlich, Robert W.; and Bliss, Douglas, 5,068,607, Cl. 324-207.160.

Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, to Bayer Aktiengesellschaft. Electrochemical process for the production of chromic acid. 5,068,015, Cl. 204-89.000.

Block, John J.: *See*—
Richmond, James W.; and Block, John J., 5,067,964, Cl. 623-18.000.

Blocker, Wesley C.: *See*—
Eisenbraun, Allan A.; and Blocker, Wesley C., 5,068,131, Cl. 427-240.000.

Blount, Inc.: *See*—
O'Neel, Timothy H., 5,067,243, Cl. 30-387.000.

Blowers, James I. Masonry hawk. 5,067,761, Cl. 294-3.500.

Bludssus, Walter: *See*—
Eckert, Joachim; and Bludssus, Walter, 5,068,097, Cl. 423-592.000.

Board of Governors of Wayne State University: *See*—
Schaap, Arthur P.; and Akhavan-Jaffi, Hashem, 5,068,339, Cl. 548-110.000.

Board of Regents, The University of Texas Sysem: *See*—
Prashad, Nagindra, 5,068,175, Cl. 435-6.000.

Board of Regents, University of Texas System: *See*—
Lipsky, Peter E.; and Thiele, Dwain L., 5,068,223, Cl. 514-019.000.

Board of Supervisors of Louisiana State University and Agricultural and Mechanical College: *See*—
Guddanti, Suresh; and Mounfield, William P., Jr., 5,068,662, Cl. 341-161.000.

Bober, Gregory D., to Ford Motor Company. Variable effort steering system. 5,067,576, Cl. 180-79.100.

Bochnitschek, Werner: *See*—
Baur, Richard; Gousetis, Charalampos; Trieselt, Wolfgang; Bochnitschek, Werner; and Oftring, Alfred, 5,068,416, Cl. 562-571.000.

Boda, Robert A., to McNeilus Truck and Manufacturing, Inc. Swing ejector for rear loading compactor. 5,067,868, Cl. 414-510.000.

Boeckmann, Hugo, to Zip-Pak Incorporated. Sealing jaws for zippered foil or film in form, fill and seal machines. 5,067,302, Cl. 53-374.800.

Boehm, Carl F., Jr., to ABB Vetco Gray Inc. Metal seal with grooved inlays. 5,067,734, Cl. 277-236.000.

Boehringer Mannheim GmbH: *See*—
Deeg, Rolf; Wehner, Rainer; Mattersberger, Johann; and Becker, Udo, 5,068,179, Cl. 435-7.920.
Schmidt, Axel; Von Der Eltz, Herbert; and Rauscher, Elli, 5,068,182, Cl. 435-22.000.

Boeing Company, The: *See*—
Miller, Glen E.; and Prater, Rudy L., 5,068,528, Cl. 250-231.130.

Boelen, Jan: *See*—
Posthuma, Sytze A.; de Graaf, Johannes D.; and Boelen, Jan, 5,068,254, Cl. 518-705.000.

Boiko, Robert S. Method to dissolve solid iron oxides. 5,068,017, Cl. 204-145.00R.

Boisture, Thomas B., to Ohmstede Mechanical Services, Inc. Multilance tube cleaning system. 5,067,558, Cl. 165-95.000.

Bokel, Arnold, to SKF GmbH. Machine bearing arrangement with form-memory deformable element. 5,067,827, Cl. 384-537.000.

Bolante, Jay J., to Appleton Electric Company. Conduit connector for eccentrically dimensioned conduit. 5,068,494, Cl. 174-65.0SS.

Bombardier Inc.: *See*—
Pelletier, Michel, 5,067,263, Cl. 37-220.000.

Bonde, Kevin G., to Tecumseh Products Company. Fitted crankcase breather valve assembly. 5,067,449, Cl. 123-41.860.

Bonifaz, Cristobal: *See*—
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

Bonit, Marc; and Demoute, Jean-Pierre, to Roussel Uclaf. Insecticidal method. 5,068,229, Cl. 514-114.000.

Bonniot, Claude E., to Societe Europeene De Propulsion. Rocket engine expansion nozzle with complementary annular nozzle. 5,067,316, Cl. 60-263.000.

Boogaards-Konnecker, Henriette S. Method of displaying a photographic emulsion. 5,068,166, Cl. 430-256.000.

Boots Company, PLC: *See*—
Jeffery, James E.; and Whybrow, Derek, 5,068,440, Cl. 564-442.000.

Borden, Frederick R.: *See*—
Miller, Gary R.; Borden, Frederick R.; and Trotta, Robert A., 5,067,238, Cl. 30-34.002.

Borgatti, Riccardo; and Tenti, Paolo, to Fiar Fabbricia Italiana Apparecchiature Radioelettriche S.p.A. High dynamic performance DC-DC converter system with time share control. 5,068,775, Cl. 363-15.000.

Borland, James E.; Chen, Y.-D. Mark; Sauer, Joe D.; Smith, Kim R.; and Smith, Rebecca F., to Ethyl Corporation. Bleaching of colored amine oxides. 5,068,430, Cl. 564-298.000.

Bose Corporation: *See*—
Short, William R., 5,068,896, Cl. 381-13.000.

Bosnyak, Robert J., to National Semiconductor Corporation. Apparatus and method for translating ECL signals to CMOS signals. 5,068,551, Cl. 307-475.000.

Bosswell, Peter; Richter, Dag; Berce, Tatjana; and Negaty-Hindi, Guy, to Battelle Development Corporation. Melt extraction of ceramics. 5,067,554, Cl. 164-463.000.

Bostad, Wayne W.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,067,867, Cl. 414-391.000.

Bostik, Inc.: *See*—
Agger, Reginald T.; Taylor, John R.; and Hardy, Alan, 5,068,143, Cl. 428-241.000.

Botti, Edoardo; Stefani, Fabrizio; and Nebuloni, Daniela, to SGS-Thomson Mocroelectronics S.r.l. Circuit for securing output distortion, in particular of final stages of audio devices. 5,068,620, Cl. 330-2.000.

Bourgeois, Michel; Chatelin, Roger; Wattiez, Daniel; Sotton, Michel; Belet, Francois; and Achard, Georges, to Institut Textile de France; and Rhovyl. Chlorofibers with permanent antiseptic character and process for their production. 5,068,113, Cl. 424-496.000.

Bourgoin, Jodi A.; Freeburne, Steven K.; Halm, Roland L.; Naasz, Brian M.; Niswonger, David S.; and VanKoevering, Dennis G., to Dow Corning Corporation. Catalyzed redistribution of polyorganosiloxanes. 5,068,383, Cl. 556-452.000.

Bouzat, Charles, to Alcatel Espace. Method of placing a geostationary telecommunicaiton satellite in orbit. 5,067,672, Cl. 244-158.00R.

Bove, Thomas A. Foldable display system with continuous display surface. 5,067,543, Cl. 160-135.000.

Bowen, Robert F.: *See*—
Sklenak, John S.; Bowen, Robert F.; and Dudley, Kenneth W., 5,068,086, Cl. 422-21.000.

Bowman, George A.: *See*—
Kawahara, Masafumi; Bowman, George A.; and Matthews, Joseph B., 5,068,586, Cl. 318-696.000.

Bowmer, Geoffrey M.; and Groth, John E., to Erico International Corporation. Reinforcing bar coupler. 5,067,844, Cl. 403-305.000.

Bozzola, Fabrizio P.: *See*—
Collins, Oliver; Dolinar, Samuel J., Jr.; Hus, In-Shek; Bozzola, Fabrizio P.; Olson, Erlend M.; Statman, Joseph I.; and Zimmerman, George A., 5,068,859, Cl. 371-43.000.

Braat, Josephus J. M.; and Opheij, Willem G., to U.S. Philips Corporation. Three element grating objective and grating-beam shaper, and optical scanning device. 5,068,751, Cl. 359-566.000.

Brace, Thomas J.: *See*—
Olson, Brennan J.; and Brace, Thomas J., 5,067,736, Cl. 280-11.200.

Braden, Rudolf: *See*—
Beck, Gunter; Kysela, Ernst; and Braden, Rudolf, 5,068,343, Cl. 548-194.000.

Bradley, Richard A.: *See*—
Niewold, D. Wayne; and Bradley, Richard A., 5,067,571, Cl. 175-394.000.

Bradshaw, Neil; and Sanderson, Neil E., to VG Instruments Group Limited. High resolution plasma mass spectrometer. 5,068,534, Cl. 250-288.000.

Brady, Cory: *See*—
Ragsdale, Kelly J.; and Brady, Cory, 5,067,213, Cl. 24-704.100.

Braig, James R.: *See*—
Yelderman, Mark; Goldberger, Daniel S.; and Braig, James R., 5,067,492, Cl. 128-719.000.

Bramham, Eric, to Shell Internationale Research Maatschappij B.V. Inflatable immersion suit. 5,067,921, Cl. 441-102.000.

Bramlett, Richard T.: *See*—
Mims, William F., Jr.; Bramlett, Richard T.; and Oatman, Kenneth G., 5,067,587, Cl. 182-63.000.

Brandt, Inc.: *See*—
Bryce, David R., 5,068,519, Cl. 235-449.000.

Brandt, Kenneth R., Sr. Semi-automatic gate. 5,067,276, Cl. 49-331.000.

Brant, Anthony W., to GSW Inc. Fascia angle adapter for an eavestrough system. 5,067,675, Cl. 248-48.200.

Brantman, Robert F. Sliding transfer device. 5,067,188, Cl. 5-81.00R.

Braun, Hans-Jurgen: *See*—
Mager, Herbert; and Braun, Hans-Jurgen, 5,067,966, Cl. 8-405.000.

Brazdil, James F., Jr.: *See*—
Bartek, Joseph P.; Brazdil, James F., Jr.; Hupp, John M.; and Grasselli, Robert K., 5,068,215, Cl. 502-208.000.

Breaux, Craig B.; Cawyer, Denny; Duplantis, Dwight; and Hiller, Don, to Axelson, Inc. Adjustable, fusible, manually operable valve lock-open assembly. 5,067,510, Cl. 137-77.000.

Brehm, Richard L. Electro wave therapy. 5,067,495, Cl. 128-421.000.

Bres, Michel: *See*—
Hartemann, Frederic; Bres, Michel; and Teillard, Roger, 5,068,860, Cl. 372-2.000.

Bridgestone Corporation: *See*—
Fujisawa, Masao; Tagomori, Satoshi; Takasaki, Mamoru; and Sato, Yoshihiro, 5,067,851, Cl. 405-115.000.
Isobe, Kazuyuki; Aizawa, Takao; Yamaguchi, Noboru; and Ueda, Yutaka, 5,068,270, Cl. 524-68.000.
Negishi, Koichi, 5,067.390, Cl. 92-48.000.

Bright, Gerald: *See*—
Nicklas, James R.; Bright, Gerald; Pullen, Eric V., deceased; and Nicklas, James R., 5,067,513, Cl. 137-98.000.

Brine, Peter J.: *See*—
Brine, William H., III; and Brine, Peter J., 5,067,726, Cl. 273-326.000.

Brine, William H., III; and Brine, Peter J., to Sports Licensing, Inc. Lacrosse stick head with a throat wall rib and ball stop member. 5,067,726, Cl. 273-326.000.

Brinkley, H. N.: *See*—
Patel, Arvind D.; McGlothlin, Raymond E.; Bleier, Roger D.; and Brinkley, H. N., 5,068,041, Cl. 507-103.000.

Brisky, Michael J. Dive flag line dispenser apparatus. 5,067,920, Cl. 441-25.000.

Bristol-Myers Company: *See*—
Sit, Sing-Yuen; and Wright, John J., 5,068,346, Cl. 548-253.000.

British Aerospace Public Limited Company: *See*—
Ball, Richard F., 5,067,411, Cl. 102-489.000.
Steel, Geoffrey, 5,068,836, Cl. 367-174.000.

British Nuclear Fuels plc: *See*—
Webster, Duncan A., 5,067,567, Cl. 173-141.000.

British Petroleum Company p.l.c., The: *See*—
Davies, Stephen G., 5,068,369, Cl. 556-16.000.

Britz, Lothar; Krug, Wolfgang; and Seferiadis, Johann, to Forschungszentrum Julich GmbH. Container having a hot wall with a high-temperature-tolerant current pass-through. 5,068,492, Cl. 174-31.500.

Broadnax, Cecil H., Jr., to Johnson & Johnson Medical, Inc. Wound drainage tube/reservoir connector. 5,067,950, Cl. 604-317.000.

Brody, Thomas P., to Magnascreen Corporation. Modular flat-screen television displays and modules and circuit drives therefor. 5,068,740, Cl. 358-241.000.

Broeske, Bryon C. Wheelbarrow having a pair of auxiliary dumping rods. 5,067,737, Cl. 280-47.310.

Bromine Compounds Ltd.: *See*—
Vainberg, Olga; and Shorr, Leonard M., 5,068,409, Cl. 562-480.000.

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Hyde, James P.; and Bryans, Thomas J., 5,067,575, Cl. 180-69.400.

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Wirth, Lawrence W.; Wegner, Wayne M.; Tomic, Mladomir; Buchko, Raymond; and Natterer, Johann, 5,067,822, Cl. 383-61.000.

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Zylka, Karl H.; and Buckley, Augustus M., Jr., 5,067,865, Cl. 411-531.000.

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Taylor, Chandler R., Jr.; Cale. Jr., Albert D.; Johnson, David N.; and Stauffer. Jr., Harold F., 5,068,231, Cl. 514-210.000.

Calgene, Inc.: *See—*
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Parente, Richard E.; De La Cruz, Richard; and Helmstetter, Richard C., 5,067,711, Cl. 273-77.00A.
Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., 5,067,715, Cl. 273-167.00F.

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Goto, Hiroshi; Harada, Toshiaki; and Ishikawa, Noriyoshi, 5,068,123, Cl. 427-32.000.
Hosaka, Akihito, 5,067,435, Cl. 118-653.000.
Ishizuka, Kou; Nishimura, Tetsuharu; Tsukiji, Masaaki; and Ishii, Satoshi, 5,067,813, Cl. 356-351.000.
Kashida, Motokazu; Shikakura, Akihiro; Yamashita, Shinichi; and Shimizu, Tetsuya, 5,068,855, Cl. 371-37.400.
Koike, Shoji; and Tomida, Yasuko, 5,067,980, Cl. 106-22.000.
Menjo, Takeshi, 5,068,692, Cl. 355-284.000.
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Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 5,068,746, Cl. 358-443.000.
Orino, Kanjyo, 5,067,802, Cl. 359-700.000.
Ouchi, Chidane, 5,067,811, Cl. 356-121.000.
Sato, Koichi; and Ikeda, Masami, 5,068,674, Cl. 346-1.100.
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Phalon, Philip A., Jr.; Caramiciu, Marius A.; and DiGiovanni, Robert C., 5,068,508, Cl. 219-85.160.

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Carcia, Peter F., to Du Pont de Nemours, E. I., and Company. Process for sputtering multilayers for magneto-optical recording. 5,068,022, Cl. 204-192.150.

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Carey, Michael D.; Smiley, William A., III; and Jansky, Gerald A., to American Standard Inc. Condenser coil arrangement for refrigeration system. 5,067,560, Cl. 165-124.000.

Cargill, Incorporated: *See—*
Chanen, Michael J.; and Roskowiak, Robert W., 5,068,114, Cl. 426-69.000.

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Greve, Peter, 5,067,951, Cl. 606-004.000.
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Carney, Michael J.: *See—*
Baker, James C.; and Carney, Michael J., 5,068,625, Cl. 331-1.00A.

Carpenter, Bryan D.: *See—*
Soules, Jack A.; and Carpenter, Bryan D., 5,067,713, Cl. 273-149.00P.

Carpenter, Walter L. Peristaltic pump system. 5,067,879, Cl. 417-472.000.

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Carter, Leewood C., to Reusable Rolls, Inc. Recyclable paperboard pallet. 5,067,418, Cl. 108-56.300.

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St. Angelo, Stephen, Jr.; Lucci, John J.; Carver, George C.; Heads, Alan; and Mitchell, James F., 5,067,225, Cl. 29-451.000.

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Strid, Eric W.; and Leake, Bernard W., 5,068,615, Cl. 324-613.000.

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Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, 5,068,298, Cl. 526-240.000.

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Castens, Rudolf R. Clutches. 5,067,601, Cl. 192-65.000.

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Concannon, David J.; Copenhaver, Gary B.; and Catchpole, Clive E., 5,068,912, Cl. 382-61.000.

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Kyrtsos, Christos T.; and Worrell, Dean A., 5,067,572, Cl. 177-139.000.
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Breaux, Craig B.; Cawyer, Denny; Duplantis, Dwight; and Hiller, Don, 5,067,510, Cl. 137-77.000.

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Cetel, Alan D.; and Duhl, David N., to United Technologies Corporation. Columnar grain superalloy articles. 5,068,084, Cl. 420-443.000.

Ceylan, Ahmet D.: *See—*
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Cha, James T.: *See—*
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Chang, Shien F. Bowl type grinding mill. 5,067,662, Cl. 241-56.000.

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Chatterjee, Amitava: *See—*
Yang, Ping; Chatterjee, Amitava; Aur, Shian; and Polgreen, Thomas L., 5,068,696, Cl. 357-23.100.

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Li, Alan Y.; Grutsch, James F.; and O'Leary, Kevin P., 5,068,036, Cl. 210-606.000.

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Sajtos, Alexander; Kloimstein, Engelbert; Hollinger, Karl; and Farnlettner, Lorenz, 5,068,417, Cl. 562-577.000.

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Chen, Catherine S. H.; and Rodewald, Paul G., to Mobil Oil Corporation. Lubricants and lube additives from epoxidation of lower olefin oligomers. 5,068,048, Cl. 252-52.00A.

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Chen, Y.-D. Mark: *See—*
Borland, James E.; Chen, Y.-D. Mark; Sauer, Joe D.; Smith, Kim R.; and Smith, Rebecca F., 5,068,430, Cl. 564-298.000.

Chenot, Charles F.; and Krebs, Michael A., to GTE Products Corporation. Europium activated strontium tetraborate UV phosphors. 5,068,055, Cl. 252-301.40R.

Cheval, Benoit: *See—*
Pfeiffer, Pierre; Cheval, Benoit; and Sigwalt, Paul, 5,067,636, Cl. 222-105.000.

Chi, Lei L. Boiling detecting devices for a stove. 5,067,474, Cl. 126-374.000.

Chiba, Toshikazu, to NEC Corporation. Display controller having a function of controlling various display memories. 5,068,648, Cl. 340-750.000.

Chien, Daniel G.: *See—*
Szabo, Steve B.; and Chien, Daniel G., 5,067,732, Cl. 277-11.000.

Chiesi Farmaceutici S.p.A.: *See—*
Kawazi, Toshikuni; Ono, Masahiro; and Inoue, Nobuko, 5,068,103, Cl. 424-81.000.

Childers, Robert W., to American Sterilizer Company. High capacity multicomponent liquid vaporizer. 5,068,087, Cl. 422-26.000.

Childs, Charles B.: *See—*
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Chinon Kabushiki Kaisha: *See—*
Ogura, Wataru, 5,068,910, Cl. 382-50.000.

Chiou, Ming-Shyang: *See—*
Fann, Yaw-Shin; Chiou, Ming-Shyang; and Kuo, Ching-Chuan, 5,067,758, Cl. 292-347.000.

Chisso Corporation: *See—*
Yamada, Kazuhiro; and Ishibashi, Tadao, 5,068,155, Cl. 428-515.000.

Choe, Young K.; Yang, Jeon W.; Lee, Jin H.; Lee, Jae S.; Shim, Kyu H.; and Kang, Jin Y., to Electronics and Telecommunications Research Institute. X-ray generation system for an ultra fine lithography and a method therefor. 5,068,884, Cl. 378-119.000.

Choi, Kwang-Moon, to SamSung Electronics Co., Ltd. Cassette loading device for a tape recorder. 5,068,758, Cl. 360-96.600.

Choinski, Graydon J.; Gummer, Allen L.; and Brooks, David W., to Indian Head Industries, Inc. Tamper-resistant brake actuator. 5,067,391, Cl. 92-48.000.

Choma, Alvin A.: *See*—
Brown, Anthony K.; Choma, Alvin A.; and Edwards, Timothy R., 5,067,935, Cl. 475-248.000.

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Butler, John D.; and Chopra, Vinod K., 5,067,379, Cl. 83-13.000.

Christensen, Richard N.: *See*—
Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., 5,067,330, Cl. 62-485.000.

Christenson, Ronald E., to McNeilus Truck and Manufacturing, Inc. Stretch trailer mixer. 5,067,740, Cl. 280-407.000.

Christianson, John, to Tarrenn Corporation. Unassisted lower torso strengthening and stretching device. 5,067,709, Cl. 272-121.000.

Chrysler Corporation: *See*—
LeClerc, David L.; and Conti, Wayne A., 5,067,997, Cl. 156-64.000.

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Chuang, Jack; and Lin, Tsung-Ping. Lighter-actuated bingo means. 5,067,895, Cl. 431-253.000.

Chung, David Y.; and Struglinski, Mark J., to Exxon Chemical Patents, Inc. Visosity index improver. 5,068,047, Cl. 252-051.50A.

Chuo Packaging Machinery Co., Ltd.: *See*—
Yamanaka, Mitsuaki, 5,067,310, Cl. 53-551.000.

Chutorash, Richard J.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,067,867, Cl. 414-391.000.

Ciba-Geigy Corporation: *See*—
Decher, Gero; and Tieka, Bernd, 5,068,318, Cl. 534-573.000.
Drabek, Josef, 5,068,441, Cl. 564-442.000.
Falk, Robert A.; Clark, Kirkland P.; Jacobson, Michael; Karydas, Athanasios; and Rodgers, Juliana, 5,068,397, Cl. 560-150.000.
Huxley, Alica; Kunz, Walter; Ackermann, Peter; and Sutter, Marius, 5,068,359, Cl. 549-58.000.
Kress, Ulrich; Maul, Rudolf; and Kintopf, Siegfried, 5,068,335, Cl. 546-242.000.
Steiner, Eginhard; Beyeler, Harry; and Husler, Rinaldo, 5,068,371, Cl. 556-53.000.
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, heir; Cornaz, Maria I., heir; and Wagnieres, Georges, 5,068,515, Cl. 219-121.730.

Clark, Cary: *See*—
Batson, James; Beernink, Ernie; Fung, David; Potel, Michael; Cabral, Art; and Clark, Cary, 5,068,644, Cl. 340-701.000.

Clark, James: *See*—
Buford, Thomas B., III; Brosnahan, Robert; Robinett, Scott; and Clark, James, 5,067,956, Cl. 606-73.000.

Clark, Kirkland P.: *See*—
Falk, Robert A.; Clark, Kirkland P.; Jacobson, Michael; Karydas, Athanasios; and Rodgers, Juliana, 5,068,397, Cl. 560-150.000.

Clark, Rodney L.; and Hester, Charles F., to Teledyne Industries, Inc. Optical interconnector and highly interconnected, learning neural network incorporating optical interconnector therein. 5,068,801, Cl. 395-25.000.

Clark, William G., Jr., to Westinghouse Electric Corp. Multiple coil eddy current probe system and method for determining the length of a discontinuity. 5,068,608, Cl. 324-220.000.

Clausen, Henrik; Yamamoto, Fumi-ichiro; White, Thayer; and Hakomori, Sen-itiroh, to Biomembrane Institute, The. Purified histoblood group A glycosyltransferase and antibodies thereto. 5,068,191, Cl. 435-193.000.

Clemence, Francois: *See*—
Moura, Anne-Marie; Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 5,068,244, Cl. 514-428.000.

Clemens, Horst: *See*—
Meixner, Jurgen; Clemens, Horst; and Sickert, Armin, 5,068,125, Cl. 427-55.000.

Clough, Thomas J.; and Moulton, Richard J., to Ensci, Inc. Bipolar plate battery. 5,068,160, Cl. 429-72.000.

Coca-Cola Company, The: *See*—
Plester, George; Leddon, Warren E.; and Dalsis, David E., 5,067,616, Cl. 209-3.100.

Cochran, Mark D.; Shih, Meng-Fu; and MacConnell, William P., to Prutech Research and Development Partnership. Attenuated pseudorabies virus which includes foreign DNA encoding an amino acid sequence. 5,068,192, Cl. 435-235.100.

Codman & Shurtleff, Inc.: *See*—
Santangelo, John, 5,067,477, Cl. 128-20.000.

Cohen, Lester S.: *See*—
Barsotti, Robert; and Cohen, Lester S., 5,068,153, Cl. 428-413.000.

Cohrs, Richard B.; Haeck, Paul J.; and Jacobs, Gary R., to Von Duprin, Inc. Panic exit device having noise suppression. 5,067,757, Cl. 292-336.300.

Cole, James A.; Roberts, William O.; and Turgeon, Joseph T., to Zaclon Corporation. Method of protecting galvanized steel from corrosion. 5,068,134, Cl. 427-376.200.

Cole, Martin G.: *See*—
Smythe, Stephen R.; Cole, Martin G.; and Grier, James S., 5,068,443, Cl. 564-496.000.

Coleman, Robert A. Rack protective device. 5,067,644, Cl. 224-324.000.

Coleman, Seab H., III. Asbestos collection and containment device. 5,067,504, Cl. 134-172.000.

Colged S.p.A.: *See*—
Guelfi, Ferdinando; and Lippi, Elio, 5,067,192, Cl. 15-302.000.

Collard, Rene F. A.: *See*—
Verheist, Paulus W. E.; Winiger, Werner J.; and Collard, Rene F. A., 5,068,809, Cl. 395-145.000.

Collins, Oliver; Dolinar, Samuel J., Jr.; Hus, In-Shek; Bozzola, Fabrizio P.; Olson, Erlend M.; Statman, Joseph I.; and Zimmerman, George A., to California Institute of Technology. Large constraint length high speed viterbi decoder based on a modular hierarchial decomposition of the deBruijn graph. 5,068,859, Cl. 371-43.000.

Collins, Walter W., to Wenoka Seastyle - A Div. of Schur, Inc. Lock for knife/sheath combination. 5,067,239, Cl. 30-151.000.

Columbia Gas System Service Corporation: *See*—
Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., 5,067,330, Cl. 62-485.000.

Columbia Scientific Inc.: *See*—
Goodenough, David J.; and Stockham, Charles, 5,068,788, Cl. 364-413.140.

Comai, Luca, to Calgene, Inc. Novel method and compositions for introducing alien DNA in vivo. 5,068,193, Cl. 435-252.300.

Combs, Charles S.: *See*—
Steiner, Klaus; Herrmann, Wolfgang; Crone, Gunter; and Combs, Charles S., 5,068,413, Cl. 562-507.000.

Combs, Todd M.; Deraedt, Gary K.; and Goodrich, Duane A., to Dowley Manufacturing, Inc. Front wheel drive hub puller. 5,067,220, Cl. 29-259.000.

Commonwealth Industrial Gases Ltd., The: *See*—
Shore, William P., 5,067,301, Cl. 53-79.000.

Commonwealth Scientific and Industrial Research Organisation: *See*—
Dick, Ian R.; Henderson, Ian D.; Kimpton, Gordon L.; and Wyatt, David S., 5,068,507, Cl. 219-73.110.

Commonwealth Scientific and Industrial Research Organization: *See*—
Field, John S., 5,067,346, Cl. 73-81.000.

Compaq Computer Corporation: *See*—
Garrett, James H., 5,068,649, Cl. 340-793.000.

Computalog Ltd.: *See*—
Foote, Dean, 5,067,874, Cl. 415-230.000.

Concannon, David J.; Copenhaver, Gary B.; and Catchpole, Clive E., to Unisys Corp. Track gauges for aligning and focussing the imaging system in a high speed document handling system. 5,068,912, Cl. 382-61.000.

Condne, Claus; Mattes, Bernhard; and Schmalz, Dieter, to Robert Bosch GmbH. Apparatus for triggering passenger protection systems. 5,068,793, Cl. 364-424.050.

Connolly, Dennis J., to Babcock & Wilcox Company, The. Aqueous carbon dioxide monitor. 5,068,090, Cl. 422-82.020.

Conoco Inc.: *See*—
Lee, Yung N.; and Wiggins, Fred R., 5,067,508, Cl. 137-13.000.

Constance, Gerald D. Hydroponic garden. 5,067,275, Cl. 47-62.000.

Constantz, James E., to United States of America, Interior. Apparatus for water desalination and drip irrigation of row crops. 5,067,272, Cl. 47-27.000.

Container Graphics Corporation: *See*—
Thomas, Daniel J., 5,067,193, Cl. 15-88.300.

Conti, Wayne A.: *See*—
LeClerc, David L.; and Conti, Wayne A., 5,067,997, Cl. 156-64.000.

Conzelmann, Gerhard; Haack, Dietmar; and Fiedler, Gerhard, to Robert Bosch GmbH. Electronic circuit device. 5,068,703, Cl. 357-36.000.

Cook, Alex M., Jr.: *See*—
West, Lamar E.; Lafay, William P.; Ghanouni, Majid; and Cook, Alex M., Jr., 5,068,893, Cl. 380-7.000.

Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., to Columbia Gas System Service Corporation. Heat transfer apparatus for heat pumps. 5,067,330, Cl. 62-485.000.

Cook, Lacy G.; and Wheeler, Bryce A., to Hughes Aircraft Company. Contaminant removal from telescope optical elements. 5,068,750, Cl. 359-399.000.

Cook, Warren R. Multiple faced cutter insert. 5,067,858, Cl. 407-114.000.

Coombes, Robert J.: *See*—
Hamilton, Robert G.; and Coombes, Robert J., 5,068,755, Cl. 360-72.100.

Coomer, Sven. Injection fitted boot liner. 5,067,257, Cl. 36-93.000.

Cooper, Edward W.; and Guerrieri, Orlando R., to Acco World Corporation. Binder locking ring mechanism with configured trigger. 5,067,840, Cl. 402-38.000.

Coors Brewing Company: *See*—
Ward, Thomas J., 5,067,857, Cl. 406-181.000.

Copenhaver, Gary B.: *See*—
Concannon, David J.; Copenhaver, Gary B.; and Catchpole, Clive E., 5,068,912, Cl. 382-61.000.

Copp, William H., Jr. Air volume booster for sprayers. 5,067,656, Cl. 239-290.000.

Coppage, A. Taylor: *See*—
Suitch, Paul R.; Coppage, A. Taylor; and Brown, Alan J., 5,068,276, Cl. 524-413.000.

Coppedge, Charles D.: *See—*
Young, Timothy M.; Coppedge, Charles D.; and McCasland, Charles S., 5,067,657, Cl. 239-403.000.
Coppens, Paul J.; Vervloet, Ludovicus H.; Leenders, Luc H.; and Schuerwegen, Ronald, to AGFA-Gevaert, N.V. Lithographic aluminum offset printing plate made according to the DTR-process. 5,068,165, Cl. 430-204.000.
Cordier, Georges; Fouilloux, Pierre; and Grosselin, Jean-Michel, to Rhone-Poulenc Sante. Process for the preparation of a catalyst. 5,068,214, Cl. 502-185.000.
Cordova, Jackie: *See—*
Titcomb, Forrest; Cordova, Jackie; and Schaule, Max W., 5,067,528, Cl. 141-4.000.
Corle, Timothy R.; Mallory, Chester L.; and Wasserman, Philip D., to Prometrix Corporation. Confocal scanning optical microscope. 5,067,805, Cl. 359-235.000.
Cormier, Frederick P. Snow rake. 5,067,197, Cl. 15-244.100.
Cornaz, Jean-Pierre, heir: *See—*
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, heir; Cornaz, Maria I., heir; and Wagnieres, Georges, 5,068,515, Cl. 219-121.730.
Cornaz, Maria I., heir: *See—*
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, heir; Cornaz, Maria I., heir; and Wagnieres, Georges, 5,068,515, Cl. 219-121.730.
Cornaz, Max M., heir: *See—*
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, heir; Cornaz, Maria I., heir; and Wagnieres, Georges, 5,068,515, Cl. 219-121.730.
Cornaz, Peter F., deceased: *See—*
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, heir; Cornaz, Maria I., heir; and Wagnieres, Georges, 5,068,515, Cl. 219-121.730.
Corning Incorporated: *See—*
Backer, Marcella R.; Cavender, Ralston; Elder, Melanie L.; Jones, Peter C.; and Murphy, James A., 5,067,975, Cl. 65-3.120.
Hall, Douglas W.; and Hawk, Robert M., 5,067,789, Cl. 385-27.000.
Cortland Cable Company, Inc.: *See—*
Scala, Eraldus, 5,067,384, Cl. 87-6.000.
Cosiett, Fred L. Collapsible sun shade and method for shielding the sun. 5,067,541, Cl. 160-84.100.
Cosman, James P.: *See—*
Pal, Jack M.; Cosman, James P.; and Tan, Karen, 5,068,280, Cl. 524-728.000.
Cotrel, Yves P. C., to Societe de Fabrication de Material Orthopedique. Vertebral implant for osteosynthesis device. 5,067,955, Cl. 606-61.000.
Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. N-substituted phenylenediamine compounds. 5,068,439, Cl. 564-434.000.
Cotton, Ronald: *See—*
Camble, Roger; Cotton, Ronald; Dutta, Anand S.; and Hayward, Christopher F., 5,068,222, Cl. 514-15.000.
Coulombeix, Colette: *See—*
Appriou, Alain; Barthelemy, Regis; and Coulombeix, Colette, 5,068,664, Cl. 342-90.000.
Cour-Palais, Burton G.: *See—*
Crews, Jeanne L.; and Cour-Palais, Burton G., 5,067,388, Cl. 89-36.020.
Courtney, Charles H. Flexible waste hose support for recreational vehicles. 5,067,679, Cl. 248-75.000.
Coutellier, Jean-Marc: *See—*
Meunier, Paul-Louis; Coutellier, Jean-Marc; and Lehureau, Jean-Claude, 5,067,230, Cl. 29-603.000.
Cover-Pools, Inc.: *See—*
Ragsdale, Kelly J.; and Brady, Cory, 5,067,213, Cl. 24-704.100.
Cowen, Timothy B., to Mentor Corporation. Corpus cavernosum implant device. 5,067,485, Cl. 128-79.000.
Cowsar, Donald R.: *See—*
Vanderbilt, David P.; Cowsar, Donald R.; Dunn, Richard L.; and English, James P., 5,068,220, Cl. 514-3.000.
Coyle, James A.: *See—*
Hays, George F.; and Coyle, James A., 5,068,196, Cl. 436-6.000.
Craig, Ronald A.: *See—*
Dejmek, James W.; and Craig, Ronald A., 5,068,898, Cl. 381-29.000.
Crane & Co.: *See—*
Crane, Timothy T., 5,068,008, Cl. 156-659.100.
Crane, Timothy T., to Crane & Co. Forming security thread for currency and bank notes. 5,068,008, Cl. 156-659.100.
Cray Computer Corporation: *See—*
Zimmerman, Eckehart; and Thorson, Thomas A., 5,067,382, Cl. 83-879.000.
Credence Systems Corporation: *See—*
Parmenter, Ronald D., 5,068,601, Cl. 324-158.00F.
Crews, Jeanne L.; and Cour-Palais, Burton G., to United States of America, National Aeronautics and Space Administration. Hypervelocity impact shield. 5,067,388, Cl. 89-36.020.
Critikon, Inc.: *See—*
Yelderman, Mark; Goldberger, Daniel S.; and Braig, James R., 5,067,492, Cl. 128-719.000.
Crochemore, Michel; and Rochin, Christophe, to Rhone-Poulenc Chimie. Process for the preparation of aromatic aldehydes. 5,068,450, Cl. 568-435.000.
Crompton, Perry D. Ring toss game. 5,067,727, Cl. 273-336.000.
Cronch, Daniel F.: *See—*
Knox, George J.; Cronch, Daniel F.; and Afflerbaugh, Martin G., 5,067,910, Cl. 439-402.000.
Crone, Gunter: *See—*
Steiner, Klaus; Herrmann, Wolfgang; Crone, Gunter; and Combs, Charles S., 5,068,413, Cl. 562-507.000.
Crotti, Pier L.; and Iazzi, Nadia, to SGS-Thomson Microelectronics S.r.l. Process for excavating trenches with a rounded bottom in a silicon substrate for making trench isolation structures. 5,068,202, Cl. 437-67.000.
Crown Equipment Corporation: *See—*
Klopfleisch, Kim A.; Wellman, Tim A.; Kaiser, Willard D.; Koenig, Mark J.; Ridgway, Richard W.; Walters, Bobby L.; and Zelinski, Matthew S., 5,068,791, Cl. 364-424.020.
Wellman, Tim A., 5,068,790, Cl. 364-424.020.
Crystal Semiconductor Corporation: *See—*
Swanson, Eric J.; and Del Signore, Bruce P., 5,068,660, Cl. 341-143.000.
CSD International B.V.: *See—*
Beele, Johannes A., 5,067,676, Cl. 248-56.000.
Culp, Gordon W., to Rockwell International Corporation. Electric traction motor. 5,068,566, Cl. 310-328.000.
Cultor Ltd.: *See—*
Jokinen, Olli; Kettunen, Jukka; Lepo, Jarkko; Niemi, Tapio; and Laine, Jaakko E, 5,068,009, Cl. 162-9.000.
Culver, Roy, Jr.: *See—*
Gibney, Michael W.; Lucas, Lawrence M.; and Culver, Roy, Jr., 5,068,116, Cl. 426-23.100.
Cummings, David H., to Milwaukee Electric Tool Corporation. Tab insulators for insulating armature core slots. 5,068,563, Cl. 310-261.000.
Cummins Engine Company, Inc.: *See—*
Rix, David M.; Long, Martin W.; Lee, Thomas R.; and Dawes, Douglas E., 5,067,464, Cl. 123-446.000.
Cupertino, California U.S.A.: *See—*
Chandran, Srikumar R.; Mau, Franco E.; and Jan, Steven A., 5,068,854, Cl. 371-37.100.
Cure, Jorge; Pappas, Panagiotis T.; and Eichler, Harry. Method and device for dispersing ions by remote action. 5,068,039, Cl. 210-695.000.
Curran, William V.: *See—*
Ziegler, Carl B., Jr.; Curran, William V.; and Feigelson, Gregg, 5,068,232, Cl. 514-210.000.
Curtis, Jeff K.: *See—*
Michaely, William J.; and Curtis, Jeff K., 5,068,423, Cl. 562-840.000.
Curtis, Thomas A.: *See—*
Lindley, Daniel D.; Curtis, Thomas A.; Ryan, Timothy R.; de la Garza, Edward M.; Hilton, Charles B.; and Kenesson, Thomas M., 5,068,448, Cl. 568-319.000.
Cuscurida, Michael; McCoy, David R.; and Lin, Jiang-Jen, to Texaco Chemical Company. Tetramines by amination of dialdehyde glycol adducts. 5,068,444, Cl. 564-505.000.
CVD Incorporated: *See—*
Kanjolia, Ravindra K.; and Hui, Benjamin C., 5,068,372, Cl. 556-70.000.
Cyclex, Inc.: *See—*
Weinshenker, Ned M.; and O'Neill, William P., 5,068,226, Cl. 514-58.000.
Weinshenker, Ned M., 5,068,227, Cl. 514-58.000.
Cyprus Foote Mineral Company: *See—*
Smith, W. Novis; and Louer, Christopher, 5,068,368, Cl. 552-556.000.
Da Costa, Caio M. F. N., to Empresa Brasileira de Compressores S/A - Embraco. Discharge flow blocking valve for a hermetic rotary compressor. 5,067,878, Cl. 417-312.000.
Dadbeh, Bemanali H., to Harvard Sports, Inc. Lawn dart with safety feature. 5,067,728, Cl. 273-420.000.
Dahl-Bettermann-Winand, Ursula. Junction bus for cable connections, in particular for cable conduits. 5,068,495, Cl. 174-65.00R.
Dai-Ichi High Frequency Co., Ltd.: *See—*
Ogata, Yoshinori; Kikuchi, Yutaka; Makino, Tsutomu; Kobayashi, Teruo; and Yoshida, Hirotaka, 5,068,491, Cl. 174-16.200.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 5,068,282, Cl. 525-61.000.
Daifuku Co., Ltd.: *See—*
Kiuchi, Naoyuki; Fujimaru, Masanori; Nakagawa, Susumu; Taguchi, Eiji; Kasagi, Masao; Kimura, Akio; and Kawabe, Shinji, 5,067,413, Cl. 104-168.000.
Daikin Industries, Ltd.: *See—*
Fukada, Eiichi; Saito, Shigeru; Yagi, Toshiharu; and Higashihata, Yoshihide, 5,067,488, Cl. 128-777.000.
Kuwahara, Yasumasa; and Leal, Walter S., 5,068,453, Cl. 568-494.000.
Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*
Misaizu, Iwao; Hanada, Kazuyuki; Shibuya, Akihiko; and Kuriyama, Katsumi, 5,068,295, Cl. 526-245.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Sasaki, Makoto; Takatsu, Haruyoshi; and Takeuchi, Kiyofumi, 5,068,462, Cl. 568-661.000.
Takagaki, Hidetsugu; Nakanishi, Shigenori; Abe, Masayoshi; Ohki, Hiromi; and Sano, Yoshiyuki, 5,068,364, Cl. 549-415.000.

Dalebout, William T.: *See—*
Watterson, Scott R.; Bersonnet, George B.; Dalebout, William T.; and Burk, Michael, 5,067,710, Cl. 272-129.000.

Dales, John R. M.; and Callander, Sidney E., to Beecham Group p.l.c. Chemical process for halogenating 2-methyl-6-methoxynaphthalene. 5,068,458, Cl. 568-634.000.

Dalsis, David E.: *See—*
Plester, George; Leddon, Warren E.; and Dalsis, David E., 5,067,616, Cl. 209-3.100.

D'Ambra, Thomas E.; Bacon, Edward R.; Bell, Malcolm R.; Carabateas, Philip M.; Eissenstat, Michael A.; Kumar, Virendra; Mallamo, John P.; and Ward, Susan J., to Sterling Drug Inc. 3-arylcarbonyl-1-(C-attached-N-heteryl)-1H-indoles. 5,068,234, Cl. 514-235.200.

Dana Corporation: *See—*
Flotow, Richard A.; and Denton, Gordon W., 5,067,602, Cl. 192-70.270.

D'Angelo, Mark D., to Kennametal Inc. Retainer for rotatable bits. 5,067,775, Cl. 299-86.000.

Danielsen, Jan. Tool holder with interchangeable fluid pressure actuated chucks. 5,067,861, Cl. 409-234.000.

Darby, H. Darrel, to Darco International Inc. Acupressure heel cup. 5,067,256, Cl. 36-69.000.

Darco International Inc.: *See—*
Darby, H. Darrel, 5,067,256, Cl. 36-69.000.

Data Instruments, Inc.: *See—*
Redlich, Robert W.; and Bliss, Douglas, 5,068,607, Cl. 324-207.160.

Davenport, Thomas A., to Siemens-Bendix Automotive Electronics Limited. Magnetically biased velocity change sensor. 5,068,502, Cl. 200-61.45M.

Davidson, Joseph W.; Blackmore, Geoffrey; Blackmore, Gerald; Komerek, Karl R., deceased; and by Komerek, Richard, executor. Briquette product, and process for its production. 5,067,968, Cl. 44-550.000.

Davies, James E.: *See—*
Pipella, Lawrence S.; Fanjoy, Logan M.; Lawless, Rodger L.; and Davies, James E., 5,068,787, Cl. 364-406.000.

Davies, Stephen G., to British Petroleum Company p.l.c., The. Process for preparing chiral sulphoxides. 5,068,369, Cl. 556-16.000.

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Evans, Alfred J., 5,067,313, Cl. 53-576.000.

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Kearney, Mark B.; Koglin, Dennis M.; and Michael, Jeffrey A., 5,068,595, Cl. 323-316.000.
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Farago, Zoltan; and Schork, Tom, 5,067,655, Cl. 239-124.000.

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Kelman, Charles D.; and DeVore, Dale P., 5,067,961, Cl. 623-5.000.
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Dewhirst, Kenneth C., to Shell Oil Company. Epoxy polymer materials. 5,068,268, Cl. 523-445.000.
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Lawrence, Richard H., 5,068,822, Cl. 395-775.000.
Titcomb, Forrest; Cordova, Jackie; and Schaule, Max W., 5,067,528, Cl. 141-4.000.
Wade, Paul C.; and Grady, JJ, III, 5,068,715, Cl. 357-81.000.
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Dr. Ing. h.c.F. Porsche AG: *See*—
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Lehr, Hans-Thomas; and Schafer, Peter, 5,068,792, Cl. 364-424.050.
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Collins, Oliver; Dolinar, Samuel J., Jr.; Hus, In-Shek; Bozzola, Fabrizio P.; Olson, Erlend M.; Statman, Joseph I.; and Zimmerman, George A., 5,068,859, Cl. 371-43.000.
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Dolotov, Boris K.: *See*—
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Dona, Marinus J. J.; and Swinkels, Johannes M. M., to U.S. Philips Corporation. Method of manufacturing a master for the fabrication of projection screens and tool for carrying out the method. 5,067,377, Cl. 82-138.000.
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., to Mobil Oil Corporation. Grease composition containing alkoxylated amide borates. 5,068,045, Cl. 252-32.007.
Donohoue, Thomas P.; Oertel, Christopher P.; Tyree, William H.; and Valdez, Joe L., to United States of America, Energy. Radionuclide calorimeter system. 5,067,820, Cl. 374-31.000.
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Caransa, Abraham; and van den Dorpel, Jan, 5,067,982, Cl. 127-67.000.
D'Orsi, Anthony; and Spector, George. Hair trimming guide having an adjustable comb. 5,067,502, Cl. 132-213.100.
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Ogata, Yoshinori; Kikuchi, Yutaka; Makino, Tsutomu; Kobayashi, Teruo; and Yoshida, Hirotaka, 5,068,491, Cl. 174-16.200.
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Harris, William I., 5,068,255, Cl. 521-28.000.
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Laughner, Michael K., 5,068,285, Cl. 525-67.000.
McConchie, Garnet E.; Mark, Frank E.; and Hollmann, Hans-Gunter, 5,068,401, Cl. 560-236.000.
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Pal, Jack M.; Cosman, James P.; and Tan, Karen, 5,068,280, Cl. 524-728.000.
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Kleyer, Don L.; and Speier, John L., 5,068,387, Cl. 556-485.000.
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Shirahata, Akihiko, 5,068,386, Cl. 556-480.000.
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Go, Winston S.; Roti, Joseph S.; Lang, Mark G.; and Weiss, Charles O., 5,068,059, Cl. 252-389.530.
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Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

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Brown, Anthony K.; Choma, Alvin A.; and Edwards, Timothy R., 5,067,935, Cl. 475-248.000.

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Suitch, Paul R.; Coppage, A. Taylor; and Brown, Alan J., 5,068,276, Cl. 524-413.000.

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Efner, Howard F., to Phillips Petroleum Company. Secondary amides in polyethylene terephthalate molding compositions. 5,068,274, Cl. 524-230.000.

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Muller, Robert; and Eisenhauer, Egon, 5,067,582, Cl. 180-380.000.

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Howard, Jerry L., 5,067,917, Cl. 439-890.000.

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Shrier, Karen P., 5,068,634, Cl. 338-21.000.

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Hu, Feng-Kang; Lau, Chung M.; Yang, Kevin; Zhu, Joshau S.; Shen, Peter S.; and Jednacz, Thomas C., 5,068,576, Cl. 315-291.000.

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Choe, Young K.; Yang, Jeon W.; Lee, Jin H.; Lee, Jae S.; Shim, Kyu H.; and Kang, Jin Y., 5,068,884, Cl. 378-119.000.

El Gamel, Abbas, to SiArc. BiCMOS logic circuit for basic applications. 5,068,548, Cl. 307-446.000.

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Becker, Gerald W.; and Riggin, Ralph M., 5,068,317, Cl. 530-399.000.
Epp, Janet K.; and Schoner, Brigitte E., 5,068,189, Cl. 435-183.000.

Elliott, Charles T.; and White, Anthony M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Multiple heterostructure photodetector. 5,068,524, Cl. 250-211.00J.

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Ellis, Christopher M. Stadium seat apparatus. 5,067,771, Cl. 297-378.000.

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Ellis, Ronald W.: *See—*
Hopper, James E.; Schultz, Loren D.; Hofmann, Kathryn J.; and Ellis, Ronald W., 5,068,185, Cl. 435-69.100.

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Fry, John J.; and Smith, Robert A., 5,068,618, Cl. 324-706.000.
Molnar, Richard J., 5,068,545, Cl. 307-311.000.

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Elscint Ltd.: *See—*
Inbar, Dan; Barnea, Daniel I.; and Bruck, Abraham, 5,067,493, Cl. 128-660.030.
Netter, Zvi; and Bar-Lev, Menachem, 5,068,786, Cl. 395-800.000.

Elsenbaumer, Ronald L.: *See—*
Jen, Kwan-Yue A.; Elsenbaumer, Ronald L.; and Shacklette, Lawrence W., 5,068,060, Cl. 252-500.000.

Emerson Electric Co.: *See—*
Koller, Frank H., 5,067,600, Cl. 192-56.00R.

Emhart Industries, Inc.: *See—*
Meyer, Kenneth R., Sr., 5,068,511, Cl. 219-98.000.

Empresa Brasileira de Compressores S/A - Embraco: *See—*
Da Costa, Caio M. F. N., 5,067,878, Cl. 417-312.000.

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Hatano, Tsutomu; Kawasaki, Sohei; Hoshino, Tetsuro; and Endo, Takamitsu, 5,068,049, Cl. 252-57.000.

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Hara, Shigeyoshi; Endo, Zen-ichiro; and Mera, Hiroshi, 5,068,296, Cl. 526-282.000.

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Miller, Jorge; and Kling, Miguel, 5,068,478, Cl. 585-324.000.

Engel, Jurgen: *See—*
Achterrath-Tuckerman, Ute; Aurich, Rudolf; Engel, Jurgen; Hettche, Helmut; and Kleeman, Axel, 5,068,233, Cl. 514-212.000.

Engel, Raul R., to Wico Distribution Corp. Joystick for mounting on dual-width panels. 5,068,498, Cl. 200-6.00A.

Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, to Cassella Aktiengesellschaft. Alkenyl-phosphonic and -phosphinic esters, process for their preparation, their use and hydrogels prepared using them. 5,068,298, Cl. 526-240.000.

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Muller, Erich; Nickl, Josef, deceased; Heckel, Armin; and Engelhardt, Gunther, 5,068,334, Cl. 546-157.000.

Engle, Thomas H., to Knorr Brake Holding Corporation. Method for semitrailer transfer. 5,067,872, Cl. 414-786.000.

English, James P.: *See—*
Vanderbilt, David P.; Cowsar, Donald R.; Dunn, Richard L.; and English, James P., 5,068,220, Cl. 514-3.000.

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Lorenzoni, Loreno; Dessantis, Nino; and Virdis, Angelo, 5,068,429, Cl. 564-160.000.

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Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

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Takeuchi, Shigeru; Murayama, Takayuki; Horiguchi, Motokuni; and Hukunaga, Masami, 5,067,904, Cl. 439-73.000.

Ensci, Inc.: *See—*
Clough, Thomas J.; and Moulton, Richard J., 5,068,160, Cl. 429-72.000.

Enspeco Inc.: *See—*
Leblanc, Charles B., 5,067,327, Cl. 62-292.000.

Entzeroth, Michael: *See—*
Grell, Wolfgang; Hurnaus, Rudolf; Reiffen, Manfred; Sauter, Robert; Pichler, Ludwig; Kobinger, Walter; Entzeroth, Michael; Mierau, Joachim; and Schingnitz, Gunter, 5,068,325, Cl. 514-215.000.

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Reed, Michael A., 5,068,835, Cl. 367-135.000.

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Ward, Gary L., 5,068,902, Cl. 381-68.600.

Epp, Janet K.; and Schoner, Brigitte E., to Eli Lilly and Company. Recombinant DNA vectors encoding a 4''-O-isovaleryl acylase derived from a carbomycin biosynthetic gene, designated carE, for use in streptomyces and other organisms. 5,068,189, Cl. 435-183.000.

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Paspek, Stephen C.; Hauser, Jeffrey B.; Eppig, Christopher P.; and Adams, Harry A., 5,068,027, Cl. 208-125.000.

Eppley, David M.; and Charpentier, Robert L. Ice fishing tip-up with indicator light and flag. 5,067,269, Cl. 43-17.000.

Erdelen, Christoph: *See—*
Fuchs, Rainer; Erdelen, Christoph; Becker, Benedikt; and Stendel, Wilhelm, 5,068,241, Cl. 514-403.000.

Erico International Corporation: *See—*
Bowmer, Geoffrey M.; and Groth, John E., 5,067,844, Cl. 403-305.000.

Ericsson, Ronald J.; and Ericsson, Scott A., to Androscore Corporation. Kit for testing human males for fertility. 5,068,089, Cl. 422-61.000.

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Behl, Klaus; Erren, Karl-Heinz; and Mantz, Ekkehard, 5,067,215, Cl. 28-190.000.

Ersek, Robert A.; Beisang, Arthur A.; and Beisang, Arthur A., III, to Bioplasty, Inc. Bio-osmotic gel for implant prostheses. 5,067,965, Cl. 623-66.000.

Escagenetics, Inc.: *See—*
Knuth, Mark E.; and Sahai, Om P., 5,068,184, Cl. 435-41.000.

Escher, Sina: *See—*
Morris, Anthony F.; Naef, Regula; Escher, Sina; and Velluz, Alain, 5,068,362, Cl. 549-346.000.

Essex, Myron E.; Allan, Jonathan S.; and Lee, Tun-Hou, to President and Fellows of Harvard College. T-cell lymphotrophic virus protein and assay. 5,068,174, Cl. 435-5.000.

Essserman, Jim: *See—*
Krause, Edward A.; Paik, Woo H.; Liu, Vincent; and Essserman, Jim, 5,068,724, Cl. 358-133.000.

Etablissements Balbinot S.A.: *See—*
Ancrenaz, Daniel M., 5,067,358, Cl. 74-61.000.

Ethyl Corporation: *See—*
Borland, James E.; Chen, Y.-D. Mark; Sauer, Joe D.; Smith, Kim R.; and Smith, Rebecca F., 5,068,430, Cl. 564-298.000.
Eisenbraun, Allan A.; and Blocker, Wesley C., 5,068,131, Cl. 427-240.000.
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Nakahara, Kei; Sakurai, Keiichi; Okamura, Toshihiko; Yoshimura, Hironori; Eto, Hiroyuki; and Kikuchi, Noribumi, 5,068,148, Cl. 428-335.000.

ETS Farnier & Penin: *See—*
Jeuffray, Jean-Marie; and Gaston, Ouvrard, 5,067,546, Cl. 160-23.100.

Etten, Paul V.: *See—*
Wicks, Michael C.; and Etten, Paul V., 5,068,671, Cl. 343-799.000.

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Van Geel, Jacobus; Magill, Joseph; Werner, Paul; and Hiernaut, Jean-Pol, 5,068,512, Cl. 219-121.600.

Europeenne de Retraitement de Catalyseurs Eurecat: *See—*
Berrebi, Georges, 5,068,477, Cl. 585-274.000.

Evans, Alfred J., to Delaware Capital Formation, Inc. Packaging device with loop attachment mechanism and skin brake. 5,067,313, Cl. 53-576.000.

Evans, Roger: *See—*
Grossman, Mark W.; and Evans, Roger, 5,068,533, Cl. 250-288.000.

Even, Stephane: *See—*
Leonard, Didier; and Even, Stephane, 5,068,592, Cl. 323-224.000.

Evensen, Laurence P. Pass-through roof seal system. 5,067,291, Cl. 52-219.000.

Evenson, Mel. Dispenser for note pad sheets. 5,067,628, Cl. 221-52.000.

Ex-Cell-O GmbH: *See—*
Putnam, Peter H.; and Durcan, Michael P., 5,067,284, Cl. 51-281.00R.

Exabyte Corporation: *See—*
Hughes, Timothy C.; and Georgis, Steven P., 5,068,757, Cl. 360-77.130.

Exar Corporation: *See—*
Giannella, Giovanni P., 5,068,702, Cl. 357-35.000.

Extrusion Dies, Inc.: *See—*
Lippert, Harry G., 5,067,432, Cl. 118-413.000.

Exxon Chemical Patents, Inc.: *See—*
Chung, David Y.; and Struglinski, Mark J., 5,068,047, Cl. 252-051.50A.
Young, David A.; Jung, John A.; and McLaughlin, Mark L., 5,068,469, Cl. 568-878.000.

Exxon Research & Engineering Company: *See—*
Brownawell, Darrell W.; Thaler, Warren A.; Bannister, Eric; and Ladwig, Paul K., 5,068,044, Cl. 252-25.000.
Hatano, Tsutomu; Kawasaki, Sohei; Hoshino, Tetsuro; and Endo, Takamitsu, 5,068,049, Cl. 252-57.000.
Peiffer, Dennis G.; and Lundberg, Robert D., 5,068,278, Cl. 524-547.000.
Singhal, Gophal H., 5,068,375, Cl. 556-136.000.

Fabris, Hans-Jurgen: *See*—
Auslander, Klaus; Fabris, Hans-Jurgen; Mock, Karl-Heinz; Patwald, Wolfgang; and Seichter, Helmut, 5,068,612, Cl. 324-327.000.

Facet Quantek, Inc.: *See*—
Mohr, Kirby S., 5,068,035, Cl. 210-236.000.

Falk, Robert A.; Clark, Kirkland P.; Jacobson, Michael; Karydas, Athanasios; and Rodgers, Juliana, to Ciba-Geigy Corporation. Trisperfluoroalkyl terminated neopentyl alcohols and derivatives therefrom. 5,068,397, Cl. 560-150.000.

Falke, Holger; and Strauss, Guenther, to Gutec. Carrier catalysts for oxidizing carbon monoxide and process for their production. 5,068,217, Cl. 502-330.000.

Falp, Benoit; and Pezant, Christian, to U.S. Philips Corp. Arrangement for determining the direction of the energy center of a luminous object. 5,068,522, Cl. 250-206.100.

Fanjoy, Logan M.: *See*—
Pipella, Lawrence S.; Fanjoy, Logan M.; Lawless, Rodger L.; and Davies, James E., 5,068,787, Cl. 364-406.000.

Fann, Yaw-Shin; Chiou, Ming-Shyang; and Kuo, Ching-Chuan, to Tong-Lung Metal Industry Co., Ltd. Lock handle assembly with limited angular movement. 5,067,758, Cl. 292-347.000.

Fanuc Ltd.: *See*—
Nakamura, Kosei, 5,068,587, Cl. 318-771.000.

Farago, Zoltan; and Schork, Tom, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt. Whirl nozzle for atomizing a liquid. 5,067,655, Cl. 239-124.000.

Farma Food A/S: *See*—
Foldager, Jorgen; Toftkjor, Helle; and Kjornos, Kim, 5,068,109, Cl. 424-441.000.

Farmatic, Inc.: *See*—
Hurnik, Frank; Jarmain, Eric; Phillips, Don; Kirkland, Michael; Harkes, Douglas; and Gordon, Donald J., 5,067,443, Cl. 119-71.000.

Farmer, Terry L.: *See*—
Johnston, David F.; and Farmer, Terry L., 5,068,811, Cl. 364-551.010.

Farmitalia Carlo Erba, S.r.l.: *See*—
Melloni, Piero; Torre, Arturo D.; Lazzari, Ettore; and Mazzini, Giuseppe, 5,068,433, Cl. 564-349.000.

Farnlettner, Lorenz: *See*—
Sajtos, Alexander; Kloimstein, Engelbert; Hollinger, Karl; and Farnlettner, Lorenz, 5,068,417, Cl. 562-577.000.

Farrell, Brian E.: *See*—
Agrawal, Rakesh; Farrell, Brian E.; and Wilson, Keith B., 5,067,976, Cl. 62-22.000.

Farrier, Ernest G.: *See*—
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Hollibush, Daniel J.; Fasnacht, Jeffery; and Eeg, Edward G., 5,068,107, Cl. 424-435.000.

Favalora, Mark L., to Hubbell Incorporated. Snap-in connector. 5,068,496, Cl. 174-65.00R.

Fawzi, Mahdi B.; Kubert, Daniel A.; and Murthy, Kuchi S., to Warner-Lambert Company. Stabilization of enteric coated dosage form. 5,068,110, Cl. 424-461.000.

Fehlig, Kenneth L., to Pentair, Incorporated. Combination air/manual economy grease dispenser. 5,067,591, Cl. 184-55.100.

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Ziegler, Carl B., Jr.; Curran, William V.; and Feigelson, Gregg, 5,068,232, Cl. 514-210.000.

Feinmechanische Optische Betriebsgesellschaft m.b.H.: *See*—
Hesske, Benno; Adnrae, Franz; and Weber, Peter, 5,067,246, Cl. 33-555.400.

Feldman, Leonard C.: *See*—
Deppe, Dennis G.; Feldman, Leonard C.; Kopf, Rose F.; Schubert, Erdmann F.; Tu, Li Wei; and Zydzik, George J., 5,068,868, Cl. 372-45.000.

Feldner, Kurt: *See*—
Degen, Bruno; Feldner, Kurt; Licht, Elke; and Wagner, Gebhard, 5,068,385, Cl. 556-472.000.

Felgentreu, Peter, to Koh-I-Noor Inc. Stylo pen tip and auxiliary removing tool. 5,067,839, Cl. 401-258.000.

Felgner, Philip L.: *See*—
Gibbons, Ian; Ullman, Edwin F.; and Felgner, Philip L., 5,068,198, Cl. 436-535.000.

Feng, Yushu: *See*—
Dixit, Sudhir S.; and Feng, Yushu, 5,068,723, Cl. 358-133.000.

Ferag AG: *See*—
Honegger, Werner, 5,067,697, Cl. 270-37.000.

Fernandez, Antonio; Gaggioni, Hugo P.; Jaquez, Martin J.; Robbins, John D.; and Soper, E. Scott, to Bell Communications Research, Inc. Memory system for high definition television display. 5,068,650, Cl. 340-799.000.

Feucht, Peter, to Siemens Aktiengesellschaft. Circuit for controlling an electro-therapy device. 5,067,953, Cl. 606-34.000.

Fezzi, Luigi; and Grassigli, Giacomo, to Industria Italiana Integratori Trei S.p.A. Controlled release protective matrices for zootechnical and veterinary use. 5,068,108, Cl. 424-438.000.

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Borgatti, Riccardo; and Tenti, Paolo, 5,068,775, Cl. 363-15.000.

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Gandiglio, Romolo, 5,067,366, Cl. 74-535.000.

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Fichtel & Sachs AG: *See*—
Roder, Manfred; and Konrad, Andreas, 5,067,599, Cl. 192-0.320.

Fiedler, Gerhard: *See*—
Conzelmann, Gerhard; Haack, Dietmar; and Fiedler, Gerhard, 5,068,703, Cl. 357-36.000.

Field, John S., to Commonwealth Scientific and Industrial Research Organization. Penetrating measuring instrument. 5,067,346, Cl. 73-81.000.

Fields, Walter D.; and Gumm, Linley F., to Tektronix, Inc. Swept frequency domain relectometry enhancement. 5,068,614, Cl. 324-534.000.

Figaro, Davy J. Book holder. 5,067,682, Cl. 248-453.000.

Figeroid, Kenneth J. Method and apparatus for conserving water used in the disposal of human body waste. 5,067,180, Cl. 4-326.000.

Filho, Jorge H.: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

Filo, Andrew, to Optum Corporation. Method to image transparent media utilizing integrated scanning. 5,068,739, Cl. 358-237.000.

Findlay, David, to Guilford Engineering Associates, Inc. Hammer safety mechanism. 5,067,266, Cl. 42-70.080.

Finean, Andrew M. Bracket system. 5,067,292, Cl. 52-235.000.

Finley, John W.: *See*—
Klemann, Lawrence P.; and Finley, John W., 5,068,119, Cl. 426-601.000.
Yarger, Ronald G.; Klemann, Lawrence P.; and Finley, John W., 5,068,120, Cl. 426-611.000.

Finsterwalder, Gerhard; Rizk, Reda; and Michels, Hans G., to Kloeckner-Humboldt-Duetz AG. Fuel injection device. 5,067,880, Cl. 417-495.000.

Firmenich SA: *See*—
Morris, Anthony F.; Naef, Regula; Escher, Sina; and Velluz, Alain, 5,068,362, Cl. 549-346.000.
Naef, Ferdinand; Delay, Francois; and Uijttewaal, Arnoldus, 5,068,452, Cl. 568-442.000.

Fischbach, Roderick C., to Wickes Manufacturing Company. Power convertible top with automatic top and tonneau sequencing. 5,067,768, Cl. 296-107.000.

Fischer, Gordon: *See*—
Bernards, Roger F.; Fischer, Gordon; and Sonnenberg, Wade, 5,068,013, Cl. 204-24.000.

Fischer, Hubertus: *See*—
Bruder, Herbert; Fischer, Hubertus; Schmitt, Franz; and Reinfelder, Hans-Erich, 5,068,609, Cl. 324-309.000.

Fischer, Joachim; and Wolf, Hubert, to Degussa Aktiengesellschaft. Method of lowering the AOX content in water. 5,068,038, Cl. 210-662.000.

Fischer, Rolf: *See*—
Merger, Franz; Fischer, Rolf; Harder, Wolfgang; Priester, Claus-Ulrich; and Vagt, Uwe, 5,068,398, Cl. 560-156.000.
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Fisher, Almon P., to Xerox Corporation. Thermal ink jet printhead with pre-diced nozzle face and method of fabrication therefor. 5,068,006, Cl. 156-633.000.

Fisher, Michael H.: *See*—
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Duncan, Gerald; Shacklock, Frank W.; and Greenman, Murray, 5,067,333, Cl. 68-23.700.

Fitzgerald, John V.; and Walsh, Teresa M., to Natonal Metal and Refining Company, Inc. Vibratory viscometer transducer with isolation support for inline viscosity sensor. 5,067,344, Cl. 73-54.000.

Flaig, Hans-Jurgen; and Jahn, Paul, to Fresenius AG. Apparatus for clamping flexible tubes. 5,067,359, Cl. 74-107.000.

Fleet, George W. J., to Monsanto Company. Bicyclic tetrahydroxypyrrolizidine. 5,068,243, Cl. 514-413.000.

Fleming, Harry A., Jr.: *See*—
Francik, Charles A.; Fleming, Harry A., Jr.; and Hock, Donald E., 5,067,295, Cl. 52-306.000.

Fleming, Stephen D., to Ford Motor Company. Vehicle bumper assembly with foamed core. 5,067,759, Cl. 293-109.000.

Flexmedics Corporation: *See*—
Lind, Stuart J., 5,067,489, Cl. 128-772.000.

Floret, Michel, to Societe Nationale Industrielle et Aerospatiale. Ultrasonic control head for parts whose shape evolves during production. 5,067,352, Cl. 73-583.000.

Flotow, Richard A.; and Denton, Gordon W., to Dana Corporation. Internally assisted clutch. 5,067,602, Cl. 192-70.270.

Flou S.p.A.: *See*—
Messina, Rosario, 5,067,187, Cl. 5-12.100.

Fochler, Fritz: *See*—
Aschaber, Hans; Bailer, Rudolf; Fochler, Fritz; Kleinstauber, Bernd; and Ruf, Reinhold, 5,067,937, Cl. 493-310.000.

Fodge, Gary L. Shoulder holster with concealed supporting chest strap. 5,067,642, Cl. 224-192.000.

Foldager, Jorgen; Toftkjor, Helle; and Kjornos, Kim, to Farma Food A/S. Antacid composition. 5,068,109, Cl. 424-441.000.

Fong, Herbert S., to Hughes Aircraft Company. Essentially passive method for inverting the orientation of a dual spin spacecraft. 5,067,673, Cl. 244-165.000.

Fong, Sherman: *See—*
Carson, Dennis A.; Fong, Sherman; and Chen, Pojen P., 5,068,177, Cl. 435-7.920.

Fonsalas, Frederic: *See—*
Haghiri, Mohammed R.; Guntzburger, Philippe; Fonsalas, Frederic; and Le Queau, Marcel, 5,068,727, Cl. 358-138.000.

Fontaine, Lawrence R.: *See—*
Scheuneman, James H.; and Fontaine, Lawrence R., 5,068,782, Cl. 395-425.000.

Fontenot, Albert M. Door security lock. 5,067,756, Cl. 292-292.000.

Foote, Dean, to Computalog Ltd. Compressive seal and pressure control arrangements for downhole tools. 5,067,874, Cl. 415-230.000.

Ford, Charles H., to Charles Henry Ford Trust, The. Anchor with axis control bar. 5,067,430, Cl. 114-294.000.

Ford Motor Company: *See—*
Auweiler, Willi; Solbach, Bernd; and Luetzeler, Robert, 5,067,250, Cl. 33-783.000.
Bober, Gregory D., 5,067,576, Cl. 180-79.100.
Fleming, Stephen D., 5,067,759, Cl. 293-109.000.
Hamburg, Douglas R., 5,067,469, Cl. 123-520.000.
Hyde, James P.; and Bryans, Thomas J., 5,067,575, Cl. 180-69.400.
Ma, Thomas T., 5,067,459, Cl. 123-295.000.

Fordham, Donald S.; Petersen, Richard A.; and Gorbet, Charles E. Simulated multimeter. 5,067,901, Cl. 434-224.000.

Foreman, Paul B.: *See—*
Gallaway, George L.; and Foreman, Paul B., 5,068,291, Cl. 525-366.000.

Forschungzentrum Julich GmbH: *See—*
Britz, Lothar; Krug, Wolfgang; and Seferiadis, Johann, 5,068,492, Cl. 174-31.500.

Fortin, Michel: *See—*
Moura, Anne-Marie; Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 5,068,244, Cl. 514-428.000.

Fosella, Gregory. Adjustable extension wrench for ratchet drive. 5,067,376, Cl. 81-115.000.

Foster, Clark B.: *See—*
Haber, Terry M.; and Foster, Clark B., 5,067,948, Cl. 604-213.000.

Fouilloux, Pierre: *See—*
Cordier, Georges; Fouilloux, Pierre; and Grosselin, Jean-Michel, 5,068,214, Cl. 502-185.000.

Fournes, Jean-Paul; and Morbioli, Rene J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Process and apparatus for the simultaneous deposition of a protective coating on internal and external surfaces of heat-resistant alloy parts. 5,068,127, Cl. 427-237.000.

Fournier, Marc W.: *See—*
Greear, John; and Fournier, Marc W., 5,067,497, Cl. 128-207.150.

Fowler, Benjamin P. Method for the removal of lead from waste products. 5,067,978, Cl. 65-134.000.

Fraioli, Joseph. Air-gas controller unit. 5,067,523, Cl. 137-625.410.

Framo Developments (UK) Limited: *See—*
Mohn, Frank, 5,068,554, Cl. 310-12.000.

Francik, Charles A.; Fleming, Harry A., Jr.; and Hock, Donald E., to Pittsburgh Corning Corporation. 45 degree block. 5,067,295, Cl. 52-306.000.

Francioni, Renzo; and Pavese, Duilio, to Cavanna S.p.A. Method and apparatus for controlling the advance of a wrapping film. 5,067,307, Cl. 53-450.000.

Franek, Henning: *See—*
Meinert, Norbert; Gelzenleuchter, Dieter; and Franek, Henning, 5,068,209, Cl. 501-30.000.

Frank, Armin C.; and Sulzer, Harry E., to Mef Co., Inc. Method of manufacturing a guarded cutting edge for a wrapping material dispenser. 5,067,222, Cl. 29-411.000.

Frank, Joseph J., to General Electric Company. End retainer ring assembly for rotary electrical devices. 5,068,564, Cl. 310-270.000.

Frankenfeld, Klaus; Beltz, Klaus; Eich, Gerhard; and Endrich, Klaus, to Chemische Fabrik Budenheim Rudolf A. Oetker. Process for the removal of cadmium ions from phosphoric acid resulting from a wet process. 5,068,094, Cl. 423-109.000.

Franko, Robert J.: *See—*
Wheeler, Edward L.; Barrows, Franklin H.; and Franko, Robert J., 5,068,271, Cl. 524-100.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Worgotter, Herbert, 5,067,412, Cl. 104-16.000.

Fraser, Michael J., to Refurbished Turbine Components Limited. Turbine blade repair. 5,067,234, Cl. 29-889.100.

Frass, Werner: *See—*
Elsaesser, Andreas; Frass, Werner; and Mohr, Dieter, 5,068,163, Cl. 430-192.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Muller, Dietmar; and Bauer, Helmut, 5,068,066, Cl. 264-3.300.

Frechet, Daniel: *See—*
Moura, Anne-Marie; Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 5,068,244, Cl. 514-428.000.

Fredericia Cellulose A/S: *See—*
Hansen, Sven K.; and Balle, Anders H., 5,068,121, Cl. 426-636.000.

Freeburne, Steven K.: *See—*
Bourgoin, Jodi A.; Freeburne, Steven K.; Halm, Roland L.; Naasz, Brian M.; Niswonger, David S.; and VanKoevering, Dennis G., 5,068,383, Cl. 556-452.000.

Freed, William L. Cervical traction device. 5,067,483, Cl. 128-76.00R.

Freitag, Dieter: *See—*
Horlacher, Peter; Serini, Volker; Freitag, Dieter; Grigo, Ulrich; Idel, Karsten-Josef; and Westeppe, Uwe, 5,068,302, Cl. 528-21.000.

French, Christopher W. Method of stacking and installing unitized roofing schemes. 5,067,299, Cl. 52-745.000.

Fresenius AG: *See—*
Flaig, Hans-Jurgen; and Jahn, Paul, 5,067,359, Cl. 74-107.000.

Freundlich, Lawrence F.; and Karmen, Arthur. Instrument for unsheathing, resheathing and disposing of a medical syringe needle. 5,067,949, Cl. 604-263.000.

Fried, Reinhard; and Jongenburger, Peter, to Asea Brown Boveri Ltd. Process for producing coarse, longitudinally oriented column crystals in an oxide-dispersion-strengthened nickel-base superalloy. 5,067,986, Cl. 148-11.50N.

Friedrich, Werner: *See—*
Balzer, Dieter; Reimer, Heinz; and Friedrich, Werner, 5,068,422, Cl. 562-587.000.

Fritsche, Wolf-Eckart: *See—*
Sichmann, Eggo; Fritsche, Wolf-Eckart; and Schlussler, Jim, 5,068,021, Cl. 204-192.140.

Fritz, Scott N.: *See—*
Plants, William C.; and Fritz, Scott N., 5,068,830, Cl. 365-190.000.

Froes, Francis H.; Shong, D. Simon; Kim, Young-Won; and Yolton, Frederick C., to United States of America, Air Force. Low temperature hydrogenation of gamma titanium aluminide. 5,067,988, Cl. 148-20.300.

Fromont, Bernard, to Thomson-CSF. Method and Device for correcting the signals given by the hydrophones of an antenna. 5,068,834, Cl. 367-135.000.

Fronczak, Frank J.: *See—*
Beachley, Norman H.; and Fronczak, Frank J., 5,067,456, Cl. 123-197.0AC.

Frost, Robert L.: *See—*
Stiffler, Stephen P.; Beach, Wayne H.; and Frost, Robert L., 5,067,262, Cl. 37-142.00R.

Fruge, Paul. Punting and soccer-style kicking shoe. 5,067,259, Cl. 36-133.000.

Frunder, Henning; and Wiedemer, Manfred, to Siemens Aktiengesellschaft. Method and apparatus for printing by inking a latent thermal image. 5,067,404, Cl. 101-488.000.

Fry, John J.; and Smith, Robert A., to Elsag International B.V. Apparatus for measuring differential impedances. 5,068,618, Cl. 324-706.000.

Frye, Dale J.; and Suman, Michael J., to Prince Corporation. Flexible sun visor with over-center spring. 5,067,765, Cl. 296-97.800.

Fryklund, Linda; Hansson, Hans A.; Kanje, Martin; and Skottner, Anna, to KabiVitrum AB. Method of improving regeneration of transfected peripheral nerves using IGF-1. 5,068,224, Cl. 514-21.000.

Fuchs, Jean M.: *See—*
Brusson, Jean M.; Bujadoux, Karel; Petit, Francis; Fuchs, Jean M.; and Mortreux, Andre , 5,068,014, Cl. 204-59.00M.

Fuchs, Paul: *See—*
Vespoli, Michael; Nelson, Bruce D.; Scragg, Carl; and Fuchs, Paul, 5,067,426, Cl. 114-56.000.

Fuchs, Rainer; Erdelen, Christoph; Becker, Benedikt; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Pesticidal substituted pyrazoline derivatives, compositions and use. 5,068,241, Cl. 514-403.000.

Fudono, Kanji; Takahashi, Toshimasa; Ogawa, Hiroshi; and Yamashita, Toshio, to Mitsubishi Jukogyo Kabushiki Kaisha. Controller of refrigerating plant. 5,067,556, Cl. 165-29.000.

Fuji Electric Co., Ltd.: *See—*
Nishiura, Akira; Kumagai, Naoki; and Seki, Yasukazu, 5,068,581, Cl. 315-370.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Hosaka, Hiroshi, 5,068,794, Cl. 364-431.050.

Fuji Photo Film Co., Ltd.: *See—*
Abe, Akira, 5,068,170, Cl. 430-393.000.
Ito, Kenji, 5,068,744, Cl. 358-310.000.
Iwabe, Kazuki; Kubo, Naoki; Tamayama, Hiroshi; Yano, Takashi; Soga, Takashi; and Koike, Hitoshi, 5,068,718, Cl. 358-27.000.
Miida, Takashi, 5,068,738, Cl. 358-227.000.
Mizuta, Akira; and Kitamura, Kazumi, 5,067,607, Cl. 198-733.000.
Morigaki, Masakazu; and Seto, Nobuo, 5,068,171, Cl. 430-9.000.
Muraishi, Katsuaki; Onishi, Masahiro; Mori, Nobufumi; Nunome, Hiromi; and Oikawa, Tetsuo, 5,067,702, Cl. 271-134.000.
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 5,068,742, Cl. 358-296.000.
Seto, Nobuo; Morigaki, Masakazu; and Naruse, Hideaki, 5,068,172, Cl. 430-551.000.
Shimura, Kazuo, 5,068,745, Cl. 358-403.000.
Takeo, Hideya, 5,068,907, Cl. 382-48.000.
Watanabe, Hideomi; and Okita, Tsutomu, 5,068,145, Cl. 428-323.000.
Yoshida, Takashi; Kawase, Tsueno; and Hiratsuka, Nobuo, 5,068,019, Cl. 204-182.800.

Fuji Photo Optical Co., Ltd.: *See—*
Ohno, Kazunori, 5,067,803, Cl. 359-708.000.
Tuchiya, Kazumichi; Nagashima, Nobuhara; Wasada, Masayoshi; and Suzuki, Akihiro, 5,068,735, Cl. 358-209.000.

Fuji Xerox Co., Ltd.: *See—*
Mukai, Toshio; and Yamashita, Yoshiro, 5,068,328, Cl. 544-350.000.

Fujii, Kenichi: *See—*
Hori, Tohru; Aoki, Masaki; and Fujii, Kenichi, 5,068,147, Cl. 428-336.000.

Fujimaru, Masanori: *See*—
Kiuchi, Naoyuki; Fujimaru, Masanori; Nakagawa, Susumu; Taguchi, Eiji; Kasagi, Masao; Kimura, Akio; and Kawabe, Shinji, 5,067,413, Cl. 104-168.000.

Fujimura, Yasuo: *See*—
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Fujisaki, Takahiko: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; and Omura, Takashi, 5,068,327, Cl. 544-76.000.

Fujisawa, Masao; Tagomori, Satoshi; Takasaki, Mamoru; and Sato, Yoshihiro, to Bridgestone Corporation. Collapsible sheet dam. 5,067,851, Cl. 405-115.000.

Fujita, Tadao: *See*—
Takayama, Jun; Fujita, Tadao; and Ninomiya, Takeshi, 5,068,716, Cl. 358-13.000.

Fujita, Takeyuki: *See*—
Ashina, Yoshiro; Fujita, Takeyuki; Niwa, Kiyonobu; Inagaki, Takeshi; and Nikaido, Yuko, 5,068,442, Cl. 564-479.000.

Fujita, Teruo: *See*—
Takeshita, Nobuo; and Fujita, Teruo, 5,068,843, Cl. 369-44.130.

Fujita, Tetsuro; Ikumoto, Takeshi; Sasaki, Shigeo; Kenji, Chiba; and Hoshino, Yukio, to Yoshitomi Pharmaceutical Industries, Ltd.; and Taito Co., Ltd. 2-aminopentanoic acid compounds and their use as immunosuppressants. 5,068,247, Cl. 514-440.000.

Fujita, Yatsuka: *See*—
Kunimi, Yuji; Tabata, Akihiko; and Fujita, Yatsuka, 5,068,467, Cl. 568-852.000.

Fujitsu Limited: *See*—
Kanegae, Masahide, 5,068,753, Cl. 360-46.000.
Mise, Tatsuya, 5,068,711, Cl. 357-71.000.
Nagakura, Masanao; and Kawashima, Masato, 5,068,693, Cl. 355-315.000.
Nishio, Yukio; and Hirose, Kazunori, 5,068,691, Cl. 355-259.000.
Nojima, Satoshi; Sakagawa, Kazuo; and Suzuki, Hideo, 5,068,820, Cl. 395-275.000.
Ohara, Shiro, 5,068,694, Cl. 357-5.000.
Sato, Shinichi, 5,068,520, Cl. 235-462.000.
Shirata, Akihiro; Watanabe, Hideaki; Hagiya, Naoyuki; Ookubo, Satomi; and Moride, Shigeki, 5,067,578, Cl. 180-197.000.
Takechi, Satoshi; Nakamura, Yuko; and Mihara, Yukari, 5,068,169, Cl. 430-313.000.

Fujitsu Ten Limited: *See*—
Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,067,465, Cl. 123-489.000.
Yamato, Toshitaka; Ito, Tatsuo; Takashima, Atsuyuki; and Motojima, Akira, 5,068,897, Cl. 381-24.000.

Fujiwara, Hideo: *See*—
Kitakami, Osamu; Fujiwara, Hideo; Ojima, Kiyotaka; Ogawa, Youichi; and Wakai, Kunio, 5,068,144, Cl. 428-323.000.
Maro, Tsuyoshi; Kitakami, Osamu; and Fujiwara, Hideo, 5,068,152, Cl. 428-408.000.

Fujiwara, Yukinari: *See*—
Taneichi, Yoshio; and Fujiwara, Yukinari, 5,068,624, Cl. 330-293.000.

Fukada, Eiichi; Saito, Shigeru; Yagi, Toshiharu; and Higashihata, Yoshihide, to Daikin Industries, Ltd.; and Shigeru Saito. Mastication detector and measurement apparatus and method of measuring mastication. 5,067,488, Cl. 128-777.000.

Fukukawa, Takao; and Suzuki, Keiichiro, to Kabushiki Kaisha Somic Ishikawa. Ball joint. 5,067,841, Cl. 403-140.000.

Fukuma, Takao: *See*—
Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,067,465, Cl. 123-489.000.

Fukuta, Kenji: *See*—
Tsuzuki, Makoto; Kimbara, Masahiko; Fukuta, Kenji; and Machii, Akihiko, 5,067,525, Cl. 139-11.000.

Fulton, Forrest F., to Wavelengths Lasers, Inc. Compensating circuit for high power lasers. 5,068,863, Cl. 372-31.000.

Fumi Photo Film Co., Ltd.: *See*—
Takehara, Hiroshi; and Ikeda, Hideo, 5,068,173, Cl. 430-567.000.

Fung, David: *See*—
Batson, James; Beernink, Ernie; Fung, David; Potel, Michael; Cabral, Art; and Clark, Cary, 5,068,644, Cl. 340-701.000.

Furusawa, Toshihiro; Satoh, Atsushi; Nakajima, Takashi; and Matsugishi, Noriaki, to Idemitsu Kosan Co., Ltd.; and Seidensha Electronics Co., Ltd. Method and apparatus for extrusion. 5,068,068, Cl. 264-23.000.

Fusaro, Angelo; and Galeazzi, Giancarlo, to A.F.G. S.r.l. Device for garaging motor vehicles. 5,067,866, Cl. 414-228.000.

Futamoto, Masaaki; Honda, Yukio; and Yoshida, Kazuetsu, to Hitachi, Ltd. Magnetic recording medium and process for preparing the same. 5,068,158, Cl. 428-694.000.

Futrex, Inc.: *See*—
Rosenthal, Robert D., 5,068,536, Cl. 250-341.000.

G. T. Norton, Inc.: *See*—
Nesser, Thomas A.; Nesser, Deborah L.; Joslyn, Edward P.; Rick, Bernard J.; Luckower, Herbert; and Barczak, John P., 5,067,630, Cl. 221-76.000.

Gabillard, Robert; Nguyen, Yann; and Semet, Christian, to Universite des Sciences et Techniques de Lille (U.S.T.L.) Flandres Artois. Device for detecting the passage of at least one mobile body in at least one location fixed by its travel. 5,068,655, Cl. 340-988.000.

Gaddipati, Achuta R.: *See*—
Singh, Raj N.; and Gaddipati, Achuta R., 5,067,998, Cl. 156-89.000.

Gadway, Jeffrey G.; and Bryson, Robert, Sr., to AM International Incorporated. Sheet material handling apparatus with inserter assembly. 5,067,699, Cl. 270-55.000.

Gaggioni, Hugo P.: *See*—
Fernandez, Antonio; Gaggioni, Hugo P.; Jaquez, Martin J.; Robbins, John D.; and Soper, E. Scott, 5,068,650, Cl. 340-799.000.

Gagnon, Yvon. Combination tool assembly. 5,067,190, Cl. 7-149.000.

Galbreath, Andrew: *See*—
Saringer, John; and Galbreath, Andrew, 5,067,479, Cl. 128-26.000.

Gale, Keith F. Valve assembly. 5,067,516, Cl. 137-414.000.

Galeazzi, Giancarlo: *See*—
Fusaro, Angelo; and Galeazzi, Giancarlo, 5,067,866, Cl. 414-228.000.

Galic, George J.: *See*—
Maus, Steven M.; and Galic, George J., 5,068,065, Cl. 264-1.300.

Galic Maus Ventures: *See*—
Maus, Steven M.; and Galic, George J., 5,068,065, Cl. 264-1.300.

Gallagher, Timothy F.: *See*—
Tischler, Allan N.; Durette, Philippe L.; Witzel, Bruce E.; Rupprecht, Kathleen M.; Gallagher, Timothy F.; Goldenberg, Marvin M.; and Allison, Debra L., 5,068,248, Cl. 514-443.000.

Gallaway, George L.; and Foreman, Paul B., to National Starch and Chemical Investment Holding Corporation. Method of preparing pressure sensitive adhesives with accelerated cure rate. 5,068,291, Cl. 525-366.000.

Galleck, Kurt-G.: *See*—
Kreutzburg, Franz; and Galleck, Kurt-G., 5,068,824, Cl. 395-800.000.

Gambale, Ronald J.: *See*—
Ullman, Timothy J.; and Gambale, Ronald J., 5,068,284, Cl. 525-67.000.

Gambini, Tiziana: *See*—
Zavatteri, Ignazio; and Gambini, Tiziana, 5,068,135, Cl. 427-439.000.

Gandais, Michel A. G.: *See*—
Delmas, Francis M. L.; and Gandais, Michel A. G., 5,067,416, Cl. 106-632.000.

Gandiglio, Romolo, to Fiat Auto S.p.A. Servo-assisted device for operating a vehicle parking brake. 5,067,366, Cl. 74-535.000.

Gandy, Carroll E.; and Watford, Roland S., Jr., to Sonoco Products Company. Method for manufacturing a yarn carrier. 5,067,936, Cl. 493-287.000.

Gangemi, Donald, to Beloit Corporation. Water jet slitter with laser finish and method. 5,068,513, Cl. 219-121.670.

Garde, Lawrence, to Seagate Technology, Inc. Method and apparatus for measuring bit shift. 5,068,754, Cl. 360-45.000.

Gardenier, John, to Saratoga Spa & Bath Co. Apparatus and method for blind attachment of a liner to a pool support structure. 5,067,228, Cl. 29-525.100.

Gardner, David M.: *See*—
Sandler, Stanley R.; Schon, Steven G.; and Gardner, David M., 5,068,427, Cl. 564-84.000.

Garnjost, Kenneth D., to Moog Inc. Vibration-isolating machine mount. 5,067,684, Cl. 248-550.000.

Garrett, James H., to Compaq Computer Corporation. Method and apparatus for displaying different shades of gray on a liquid crystal display. 5,068,649, Cl. 340-793.000.

Garrick, James C., to Judges Kricket Kisser, Inc. Method and apparatus for dispensing live fishing bait. 5,067,270, Cl. 43-55.000.

Garuti, Giuseppe. System for fixing anodized aluminum. 5,068,032, Cl. 210-96.100.

Garver, Lawrence E.; and Kimbrough, Gregory L., to Van Dorn Company. Pet container for hot filled applications. 5,067,622, Cl. 215-1.00C.

Garvey, Cormac: *See*—
Lang, John; and Garvey, Cormac, 5,067,532, Cl. 141-329.000.

Gascoyne, William H., to LSI Logic Corporation. Process monitor circuit. 5,068,547, Cl. 307-443.000.

Gaskill, Albert. Universal wheelless carrier. 5,067,640, Cl. 224-42.070.

Gaston, Ouvrard: *See*—
Jeuffray, Jean-Marie; and Gaston, Ouvrard, 5,067,546, Cl. 160-23.100.

Gates Rubber Company, The: *See*—
Bickely, Alan C.; and Moore, Travis, 5,068,638, Cl. 338-114.000.

Gatten, Ronald A., to Spectra-Physics, Inc. Method of determining useful life of cartridge for an ink jet printer. 5,068,806, Cl. 395-113.000.

Gatto, Vincent J., to Ethyl Corporation. Bicyclictriarylphosphite antioxidant. 5,068,388, Cl. 558-74.000.

Gautier, Jean-Pierre, to Bendix Europe Services Techniques. Pneumatic booster. 5,067,392, Cl. 92-98.00D.

GE Fanuc Automation North America, Inc.: *See*—
Sexton, Daniel W.; and Bentley, William F., 5,068,821, Cl. 395-800.000.

GE Plastics Japan Ltd.: *See*—
Campbell, John R.; Shea, Timothy J.; Hobbs, Stanley Y.; and Brown, Sterling B., 5,068,286, Cl. 525-92.000.

Gebr. Hofmann GmbH & Co. KG Maschinenfabrik: *See*—
Himmler, Gunther; and Moench, Uwe, 5,067,348, Cl. 73-460.000.
Monch, Uwe, 5,067,347, Cl. 73-146.000.

GEC Alsthom SA: *See*—
Moncorge, Jean-Paul, 5,068,598, Cl. 324-107.000.

Gelzenleuchter, Dieter: *See*—
Meinert, Norbert; Gelzenleuchter, Dieter; and Franek, Henning, 5,068,209, Cl. 501-30.000.

Gen Corp Inc.: *See*—
Dupuy, Ronald E., 5,067,281, Cl. 49-502.000.

Genbauffe, Francis S., to Robertshaw Controls Company. Fuel control device, fuel control system using the device and method of making the device. 5,067,651, Cl. 236-15.00A.

GenCorp Inc.: *See*—
Lenke, Gerd M.; and Wiff, Donald R., 5,068,292, Cl. 525-509.000.
Stevenson, James F.; and Miller, William H., 5,067,885, Cl. 425-131.100.

General Atomics: *See*—
Ohkawa, Tihiro, 5,068,543, Cl. 307-91.000.
Streckert, Holger H.; Sheehan, James E.; and Mazdiyasni, Khodabakhsh, 5,067,999, Cl. 156-89.000.

General Dynamics Corporation, Convair Division: *See*—
Guth, Lloyd A., 5,067,908, Cl. 439-248.000.

General Electric Company: *See*—
Bayer, Eric W., 5,068,637, Cl. 338-57.000.
Beers, David G., 5,067,322, Cl. 62-515.000.
Brown, Stephen E.; Meeks, Donnie F.; Souders, Ralph W.; and Thompson, Richard A., 5,068,763, Cl. 361-364.000.
Dellacoletta, Brent A., 5,068,353, Cl. 548-461.000.
Eberhard, Jeffrey W., 5,068,882, Cl. 378-4.000.
Frank, Joseph J., 5,068,564, Cl. 310-270.000.
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Moreman, Otis S., III, 5,067,876, Cl. 416-219.00R.
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Yeager, Gary W.; and Schissel, David N., 5,068,457, Cl. 568-633.000.

General Instrument Corporation: *See*—
Katznelson, Ron D.; and Krause, Edward A., 5,068,729, Cl. 358-141.000.
Krause, Edward A.; Paik, Woo H.; Liu, Vincent; and Essserman, Jim, 5,068,724, Cl. 358-133.000.

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Musschoot, Albert, 5,067,549, Cl. 164-39.000.

General Motors Corporation: *See*—
Joshi, Shrikant M.; and Oddi, Frederick V., 5,067,561, Cl. 165-140.000.
St. Angelo, Stephen, Jr.; Lucci, John J.; Carver, George C.; Heads, Alan; and Mitchell, James F., 5,067,225, Cl. 29-451.000.

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Baxter, Ronald D.; and Kroninger, Paul M., Jr., 5,068,205, Cl. 437-205.000.

Genetic Systems Corporation: *See*—
Nowinski, Robert C., 5,068,178, Cl. 435-7.200.

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Montanari, Dennis G.; Gentilman, Richard L.; and Tustison, Randal W., 5,067,781, Cl. 359-350.000.

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Hunziker, Bruno; and Kunz, Peter, 5,067,691, Cl. 251-315.000.

George, Eric R.; and Gergen, William P., to Shell Oil Company. Reinforced polymer compositions. 5,068,289, Cl. 525-179.000.

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Gerin, Merlin: *See*—
Broyde, Frederic; and Barrault, Michel, 5,068,616, Cl. 324-627.000.

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Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, 5,068,298, Cl. 526-240.000.

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West, Lamar E.; Lafay, William P.; Ghanouni, Majid; and Cook, Alex M., Jr., 5,068,893, Cl. 380-7.000.

Ghoshal, Sajol C., to Level One Communications, Inc. Digitally controlled timing recovery loop. 5,068,628, Cl. 331-1.00A.

Giannella, Giovanni P., to Exar Corporation. Programmable transistor. 5,068,702, Cl. 357-35.000.

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Senatore, Daniele, 5,067,795, Cl. 359-84.000.

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Gibney, Michael W.; Lucas, Lawrence M.; and Culver, Roy, Jr., to Micro-Blend, Inc. Method for beverage blending and proportioning. 5,068,116, Cl. 426-23.100.

Gibson, Charles A.: *See*—
Burgess, Lloyd M.; and Gibson, Charles A., 5,068,329, Cl. 544-402.000.
Burgess, Lloyd M.; and Gibson, Charles A., 5,068,330, Cl. 544-402.000.

Giglia, Salvatore: *See*—
Bikson, Benjamin; Giglia, Salvatore; and Nelson, Joyce K., 5,067,971, Cl. 55-16.000.

Gignac, William J.: *See*—
Hasenberg, Thomas C.; and Gignac, William J., 5,068,867, Cl. 372-45.000.

Gilcrease, John T. Auger and sweeper assembly. 5,067,569, Cl. 175-209.000.

Gilcrease, John T. Auger and retaining shell assembly. 5,067,570, Cl. 175-209.000.

Gildemeister Italiana S.p.A.: *See*—
Ronzoni, Enrico, 5,067,735, Cl. 279-1.00F.

Gill Studios, Inc.: *See*—
Harms, Jeffrey W., 5,067,265, Cl. 40-1.500.

Gillett, Richard B., Jr.; and Williams, Douglas D., to Digital Equipment Corporation. Method and apparatus for managing multiple lock indicators in a multiprocessor computer system. 5,068,781, Cl. 395-325.000.

Gillette Company, The: *See*—
Miller, Gary R.; Borden, Frederick R.; and Trotta, Robert A., 5,067,238, Cl. 30-34.002.

Gillham, Frederick J.; and Stowe, David W., to Aster Corporation. Electro-optical converter. 5,067,787, Cl. 385-50.000.

Giunchi, Giovanni; Savrun, Ender; Grenni, Alberto; and Chen, Ching-Fong, to Keramont Italia S.p.A. Refractory and electroconductive ceramic compositions and process for the preparation thereof. 5,068,211, Cl. 501-98.000.

GKN Automotive AG: *See*—
Krude, Werner, 5,067,929, Cl. 464-145.000.

Glaxo Group Limited: *See*—
Long, David R., 5,068,249, Cl. 514-471.000.

Glenn, Paul, to Bauer Associates, Inc. Method and device for noncontacting self-referencing measurement of surface curvature and profile. 5,067,817, Cl. 356-376.000.

Glennon, Timothy F.; Mehl, Byron R.; Thollot, Pierre; and Krinickas, Alexander, to Sundstrand Corporation. Brushless generator having AC excitation in generating and starting modes. 5,068,590, Cl. 322-10.000.

Globe Environmental Protection, Inc.: *See*—
Wang, Lawrence K.; Wang, Mu H. S.; Hwang, Chong S.; and Rhow, Harold, 5,068,031, Cl. 210-96.100.

Go, Winston S.; Roti, Joseph S.; Lang, Mark G.; and Weiss, Charles O., to Drew Chemical Corporation. Corrosion inhibitor. 5,068,059, Cl. 252-389.530.

Gobbo, Joao C.: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

Gockler, Heinz, to ANT Nachrichtentechnik GmbH. Non-recursive half-band filter with complex valued coefficients for complex input and output signals. 5,068,817, Cl. 364-724.160.

Godecke Aktiengesellschaft: *See*—
Steiner, Klaus; Herrmann, Wolfgang; Crone, Gunter; and Combs, Charles S., 5,068,413, Cl. 562-507.000.

Gold, Danny. Padded garment. 5,067,175, Cl. 2-16.000.

Gold, Ronald S.; and Jachimowicz, Karen E., to Honeywell Inc. Beam combining/splitter cube prism for color polarization. 5,067,799, Cl. 359-490.000.

Goldberger, Daniel S.: *See*—
Yelderman, Mark; Goldberger, Daniel S.; and Braig, James R., 5,067,492, Cl. 128-719.000.

Goldenberg, Marvin M.: *See*—
Tischler, Allan N.; Durette, Philippe L.; Witzel, Bruce E.; Rupprecht, Kathleen M.; Gallagher, Timothy F.; Goldenberg, Marvin M.; and Allison, Debra L., 5,068,248, Cl. 514-443.000.

Goldstar Co., Ltd.: *See*—
Lee, Byung C., 5,067,884, Cl. 418-63.000.

Goldwell AG: *See*—
Tennigkeit, Jurgen; and Rose, Burkhard, 5,068,102, Cl. 424-72.000.

Golf Vegas International, Inc.: *See*—
Knox, J. Paul; Murray, Robert B., III; and Smith, Clinton L., 5,067,718, Cl. 273-185.00R.

Gombas, Robert D., Jr.: *See*—
Moretta, Jon C.; and Gombas, Robert D., Jr., 5,068,024, Cl. 208-13.000.

Gomoll, Guenter; and Hauslaib, Wolfgang, to Mannesmann A.G. Ribbon shifting device for printers. 5,067,833, Cl. 400-213.000.

Gonzalez-Miller, Walter E.; and Dulin, Jacques M., to Depressurized Technologies International, Inc. Aerosol can recycling apparatus and methods. 5,067,529, Cl. 141-7.000.

Goodenough, David J.; and Stockham, Charles, to Columbia Scientific Inc. Quantitative computed tomography system. 5,068,788, Cl. 364-413.140.

Goodman, Morris G. Adjustable spiral slitter for hot dogs. 5,067,241, Cl. 30-289.000.

Goodrich, Duane A.: *See*—
Combs, Todd M.; Deraedt, Gary K.; and Goodrich, Duane A., 5,067,220, Cl. 29-259.000.

Goodyear Tire & Rubber Company, The: *See*—
Cottman, Kirkwood S., 5,068,439, Cl. 564-434.000.

Gorbet, Charles E.: *See*—
Fordham, Donald S.; Petersen, Richard A.; and Gorbet, Charles E., 5,067,901, Cl. 434-224.000.

Gordon, Donald J.: *See*—
Hurnik, Frank; Jarmain, Eric; Phillips, Don; Kirkland, Michael; Harkes, Douglas; and Gordon, Donald J., 5,067,443, Cl. 119-71.000.

Gordon, Roger G., to Unirac Corp. Single paper dispenser. 5,067,605, Cl. 194-248.000.

Gors, Heinrich C.; Horner, Patrick J.; and Jansons, Viktors, to Raychem Corporation. Friedel-crafts preparation of aromatic ketones with an inoganic salt controlling agent. 5,068,447, Cl. 568-309.000.

Goto, Hiroaki: *See*—
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,068,266, Cl. 523-336.000.

Goto, Hiroshi; Harada, Toshiaki; and Ishikawa, Noriyoshi, to Canon Kabushiki Kaisha. Process for producing recording medium and apparatus therefor. 5,068,123, Cl. 427-32.000.

Goto, Masayoshi: *See*—
Inukai, Sinji; Agata, Mitsuzi; Umezawa, Manami; Horio, Yoshihiro; Ootake, Yasuhiro; Sawaki, Shohei; and Goto, Masayoshi, 5,068,239, Cl. 514-381.000.

Gotthelf, Hans: *See*—
Heeren, Evert; and Gotthelf, Hans, 5,067,659, Cl. 241-19.000.

Gousetis, Charalampos: *See*—
Baur, Richard; Gousetis, Charalampos; Trieselt, Wolfgang; Bochnitschek, Werner; and Oftring, Alfred, 5,068,416, Cl. 562-571.000.

Grady, JJ, III: *See*—
Wade, Paul C.; and Grady, JJ, III, 5,068,715, Cl. 357-81.000.

Graham Engineering Corporation: *See*—
Dundas, Dennis L.; and Moore, Eugene L., 5,068,075, Cl. 264-505.000.

Grandjean, Pierre-Andre, to Medtronic, Inc. Muscle fitness detection by colorimetry. 5,067,960, Cl. 623-3.000.

Grasselli, Robert K.: *See*—
Bartek, Joseph P.; Brazdil, James F., Jr.; Hupp, John M.; and Grasselli, Robert K., 5,068,215, Cl. 502-208.000.

Grassigli, Giacomo: *See*—
Fezzi, Luigi; and Grassigli, Giacomo, 5,068,108, Cl. 424-438.000.

Graves Spray Supply, Inc.: *See*—
Smith, James E., 5,067,515, Cl. 137-327.000.

Gray Engineering, Inc.: *See*—
Gray, Robert L., 5,067,850, Cl. 405-92.000.

Gray Printing Company, The: *See*—
Dick, David L., 5,067,700, Cl. 270-55.000.

Gray, Robert L., to Gray Engineering, Inc. Apparatus for detection and containment of pollutants in a drainage system. 5,067,850, Cl. 405-92.000.

Greear, John; and Fournier, Marc W., to Progressive Medical Design, Inc. Intubation device with adjustable suction means above the cuff. 5,067,497, Cl. 128-207.150.

Green, Raymond M.: *See*—
Swanson, Dail L.; Green, Raymond M.; and Bennorth, Gregory S., 5,068,639, Cl. 338-179.000.

Greenman, Murray: *See*—
Duncan, Gerald; Shacklock, Frank W.; and Greenman, Murray, 5,067,333, Cl. 68-23.700.

Grell, Wolfgang; Hurnaus, Rudolf; Reiffen, Manfred; Sauter, Robert; Pichler, Ludwig; Kobinger, Walter; Entzeroth, Michael; Mierau, Joachim; and Schingnitz, Gunter, to Karl Thomae GmbH. 4,5,7,8-tetrahydro-6H-thiazolo[5,4-d]azepines, their preparation and their use as pharmaceutical compositions. 5,068,325, Cl. 514-215.000.

Grenni, Alberto: *See*—
Giunchi, Giovanni; Savrun, Ender; Grenni, Alberto; and Chen, Ching-Fong, 5,068,211, Cl. 501-98.000.

Gresham, Gary E.; and Tucker, Burnis H., to Transportation Technologies, Inc. Electronic shifter. 5,068,583, Cl. 318-266.000.

Gresser, Joseph D.: *See*—
Wise, Donald L.; Augenstein, Don C.; and Gresser, Joseph D., 5,068,188, Cl. 435-140.000.

Gretag Aktiengesellschaft: *See*—
Ott, Hans, 5,068,810, Cl. 364-526.000.

Greve, Peter, to Carl-Zeiss-Stiftung. Ophthalmologic apparatus. 5,067,951, Cl. 606-004.000.

Greven, Hermann: *See*—
Hagmann, Paul; and Greven, Hermann, 5,067,611, Cl. 206-383.000.

Grier, James S.: *See*—
Smythe, Stephen R.; Cole, Martin G.; and Grier, James S., 5,068,443, Cl. 564-496.000.

Grigo, Ulrich: *See*—
Horlacher, Peter; Serini, Volker; Freitag, Dieter; Grigo, Ulrich; Idel, Karsten-Josef; and Westeppe, Uwe, 5,068,302, Cl. 528-21.000.

Grigsby, Richard: *See*—
Hawkins, Ronald G.; and Grigsby, Richard, 5,067,786, Cl. 385-13.000.

Grillo, John M.; Hilby, James A.; La Croix, Mark E.; Polinsky, Mark A.; and Steltzer, Gordon L., to Torrington Company, The. Sensor to determine rotational parameters. 5,067,350, Cl. 73-494.000.

Grip, Nils-Erik G.: *See*—
Nortenius, Bengt-Arne; Olsson, Per-Erik B.; and Grip, Nils-Erik G., 5,067,248, Cl. 33-744.000.

Gris, Joel, to U.S. Philips Corporation. Multiple coupler device with return path. 5,068,630, Cl. 333-100.000.

Grollimund, Everett C.: *See*—
Brookman, Donald L.; Grollimund, Everett C.; Grollimund, Gary E.; and Spiers, Steven F., 5,067,303, Cl. 53-381.200.

Grollimund, Gary E.: *See*—
Brookman, Donald L.; Grollimund, Everett C.; Grollimund, Gary E.; and Spiers, Steven F., 5,067,303, Cl. 53-381.200.

Grosselin, Jean-Michel: *See*—
Cordier, Georges; Fouilloux, Pierre; and Grosselin, Jean-Michel, 5,068,214, Cl. 502-185.000.

Grossman, Mark W.; and Evans, Roger, to GTE Products Corporation. Manifold and method of batch measurement of Hg-196 concentration using a mass spectrometer. 5,068,533, Cl. 250-288.000.

Grosz, Edward G.; Herrington, Fox J.; and St. Phillips, Eric A., to Mobil Oil Corporation. Disposable plastic cup dispenser with spring. 5,067,633, Cl. 221-279.000.

Groth, John E.: *See*—
Bowmer, Geoffrey M.; and Groth, John E., 5,067,844, Cl. 403-305.000.

Gruhler, Siegfried: *See*—
Klingler, Otto; Gruhler, Siegfried; and Rivinius, Helmut, 5,068,653, Cl. 340-870.370.

Grumman Aerospace Corporation: *See*—
Solomon, Allen L., 5,067,233, Cl. 29-852.000.

Grutsch, James F.: *See*—
Li, Alan Y.; Grutsch, James F.; and O'Leary, Kevin P., 5,068,036, Cl. 210-606.000.

Gryzbowski, Richard W.: *See*—
Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,067,916, Cl. 439-857.000.

GSW Inc.: *See*—
Brant, Anthony W., 5,067,675, Cl. 248-48.200.

GTE Laboratories Incorporated: *See*—
Dixit, Sudhir S.; and Feng, Yushu, 5,068,723, Cl. 358-133.000.

GTE Products Corporation: *See*—
Chenot, Charles F.; and Krebs, Michael A., 5,068,055, Cl. 252-301.40R.
Grossman, Mark W.; and Evans, Roger, 5,068,533, Cl. 250-288.000.

GTE Rotaflex Limited: *See*—
Woodgate, Terence A., 5,067,906, Cl. 439-115.000.

Gubelmann, Michel; Rochin, Christophe; and Allandrieu, Christian, to Rhone-Poulenc Chimie. Preparation of methylenedi (phenylurethane). 5,068,391, Cl. 560-25.000.

Guddanti, Suresh; and Mounfield, William P., Jr., to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College. Neural network analog-to-digital converter. 5,068,662, Cl. 341-161.000.

Gudov, Vasily F.; Yakhontov, Nikolai E.; Kharchenko, Vladimir P.; Dolotov, Boris K.; Belousov, Evgeny L.; Vinitsky, Valery B.; Kozlov, Alexandr M.; Akhalaya, Mikail G.; Koveshinikov, Alexandr D.; and Pugachev, Valery F. Method and apparatus for treating malignant tumors by local hyperpyrexia. 5,067,952, Cl. 606-28.000.

Guelfi, Ferdinando; and Lippi, Elio, to Comed S.p.A. Automatic machine for washing self-service trays and similar items. 5,067,192, Cl. 15-302.000.

Guerrieri, Orlando R.: *See*—
Cooper, Edward W.; and Guerrieri, Orlando R., 5,067,840, Cl. 402-38.000.

Guilford Engineering Associates, Inc.: *See*—
Findlay, David, 5,067,266, Cl. 42-70.080.

Guindulain Vidondo, Felix, to Jofemar, S.A. Single product extractor. 5,067,634, Cl. 221-298.000.

Gumm, Linley F.: *See*—
Fields, Walter D.; and Gumm, Linley F., 5,068,614, Cl. 324-534.000.

Gummer, Allen L.: *See*—
Choinski, Graydon J.; Gummer, Allen L.; and Brooks, David W., 5,067,391, Cl. 92-48.000.

Gunji, Akihiko; Masuki, Tetsuya; and Shirai, Hidenori, to Kao Corporation. Process for making film. 5,068,070, Cl. 264-41.000.

Guntzburger, Philippe: *See*—
Haghiri, Mohammed R.; Guntzburger, Philippe; Fonsalas, Frederic; and Le Queau, Marcel, 5,068,727, Cl. 358-138.000.

Gustafson, Bruce L.; and Walden, James V., to Eastman Kodak Company. Conversion of carbon dioxide to carbon monoxide. 5,068,057, Cl. 252-373.000.

Gustafsson, Helmer, to Yhtyneet Paperitehtaat Oy Walkisoft Engineering. Method for forming a dry web on the wire. 5,068,079, Cl. 264-518.000.

Gutec: *See*—
Falke, Holger; and Strauss, Guenther, 5,068,217, Cl. 502-330.000.

Guth, Lloyd A., to General Dynamics Corporation, Convair Division. Self-aligning connector. 5,067,908, Cl. 439-248.000.

Haack, Dietmar: *See*—
Conzelmann, Gerhard; Haack, Dietmar; and Fiedler, Gerhard, 5,068,703, Cl. 357-36.000.

Haber, Terry M., to Habley Medical Technology Corporation. Single use, safety blood collecting device. 5,067,490, Cl. 128-763.000.

Haber, Terry M.; and Foster, Clark B., to Habley Medical Technology Corporation. Safety, packaging, injection and disposal system for pre-filled pharmaceutical vials. 5,067,948, Cl. 604-213.000.

Habley Medical Technology Corporation: *See—*
Haber, Terry M., 5,067,490, Cl. 128-763.000.
Haber, Terry M.; and Foster, Clark B., 5,067,948, Cl. 604-213.000.

Habuchi, Ryoji: *See—*
Kato, Nobuyuki; Habuchi, Ryoji; Morisawa, Kunio; and Itoh, Hiroshi, 5,067,603, Cl. 192-0.076.

Hackett, James I.; Dellert, David W.; and Knudson, Mark R., to Eastman Kodak Company. Scaler gate array for scaling image data. 5,068,905, Cl. 382-47.000.

Haeck, Paul J.: *See—*
Cohrs, Richard B.; Haeck, Paul J.; and Jacobs, Gary R., 5,067,757, Cl. 292-336.300.

Haensch, Theodor: *See—*
Hemmerich, Andreas; McIntyre, David; Zimmermann, Claus; and Haensch, Theodor, 5,068,546, Cl. 359-328.000.

Hafla, Dietmar F., to Index-Werke GmbH & Co. KG Hahn & Tessky. Clearance-free spindle drive. 5,067,363, Cl. 74-392.000.

Hafner, V. Walter; and Marshall, Keith D., to Acorn Engineering Company. Blow out toilet with low water volume usage. 5,067,181, Cl. 4-425.000.

Hagedorn, Scott: *See—*
Ruppen, Mark E.; and Hagedorn, Scott, 5,068,414, Cl. 562-508.000.

Hagemeyer, Bruce A., to Rolscreen Company. Self draining door threshold. 5,067,279, Cl. 49-471.000.

Hagen, Arnulf P.: *See—*
Brunken, Dean E.; and Hagen, Arnulf P., 5,068,132, Cl. 427-421.000.

Haghiri, Mohammed R.; Guntzburger, Philippe; Fonsalas, Frederic; and Le Quesu, Marcel, to U. S. Philips Corporation. Device for decoding signals representative of a sequence of images and high definition television image transmission system including such a device. 5,068,727, Cl. 358-138.000.

Hagino, Sadaaki; Suzuki, Motokazu; Kondo, Hideyuki; Nishikawa, Shigeru; and Hayashi, Kenichi, to Mitsubishi Materials Corporation. High strength superconducting wires and cables each having high current density, and a process for fabricating them. 5,068,219, Cl. 505-1.000.

Hagiya, Naoyuki: *See—*
Shirata, Akihiro; Watanabe, Hideaki; Hagiya, Naoyuki; Ookubo, Satomi; and Moride, Shigeki, 5,067,578, Cl. 180-197.000.

Hagmann, Paul; and Greven, Hermann, to William Prym-Werke GmbH & Co. KG. Blister pack for storage of needles and the like. 5,067,611, Cl. 206-383.000.

Haitko, Deborah A.: *See—*
Schissel, David N.; and Haitko, Deborah A., 5,068,352, Cl. 548-461.000.

Hakomori, Sen-itiroh: *See—*
Clausen, Henrik; Yamamoto, Fumi-ichiro; White, Thayer; and Hakomori, Sen-itiroh, 5,068,191, Cl. 435-193.000.

Hall, Douglas W.; and Hawk, Robert M., to Corning Incorporated. Fiber optic coupling filter and amplifier. 5,067,789, Cl. 385-27.000.

Hall, Kevin P., to Minnesota Mining and Manufacturing Company. High contrast photographic materials. 5,068,167, Cl. 430-264.000.

Hall, Lee O.; Zoski, Glenn; and Tyagi, Surendera K., to Igen, Inc. Method and apparatus for conducting electrochemiluminescent measurements. 5,068,088, Cl. 422-52.000.

Halliburton Company: *See—*
Holtmyer, Marlin; and Hunt, Charles V., 5,067,565, Cl. 166-305.100.
Young, Timothy M.; Coppedge, Charles D.; and McCasland, Charles S., 5,067,657, Cl. 239-403.000.

Halloran, Daniel J.; and Varaprath, Padmakumari J., to Dow Corning Corporation. Thioglycolamide-functional siloxanes. 5,068,378, Cl. 556-420.000.

Halm, Roland L.: *See—*
Bourgoin, Jodi A.; Freeburne, Steven K.; Halm, Roland L.; Naasz, Brian M.; Niswonger, David S.; and VanKoevering, Dennis G., 5,068,383, Cl. 556-452.000.

Hamada, Masataka: *See—*
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Ishida, Tokuji; Hamada, Masataka; and Norita, Toshio, 5,068,737, Cl. 358-227.000.

Hamamatsu Photonics K.K.: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; Suzuki, Tomoko; and Kan, Hirofumi, 5,068,815, Cl. 364-713.000.

Hamasaki, Masaharu, to Sony Corporation. Solid state imaging device which has a short time constant which is shorter than the application of a pulse voltage until the end of the blanking period. 5,068,736, Cl. 358-213.130.

Hamburg, Douglas R., to Ford Motor Company. Fuel vapor recovery system and method. 5,067,469, Cl. 123-520.000.

Hamilton, Robert G.; and Coombes, Robert J., to Micropolis Corporation. Sector pulse generator for hard disk drive assembly. 5,068,755, Cl. 360-72.100.

Han, Scott; Martenak, Daniel J.; Palermo, Robert E.; and Walsh, Dennis E., to Mobil Oil Corporation. Process for direct oxidative conversion of methane to higher hydrocarbons at high pressure and moderate temperature. 5,068,486, Cl. 585-500.000.

Hanada, Kazunori: *See—*
Murata, Mitsuo; Yokoo, Chihiro; and Hanada, Kazunori, 5,068,354, Cl. 548-517.000.

Hanada, Kazuyuki: *See—*
Misaizu, Iwao; Hanada, Kazuyuki; Shibuya, Akihiko; and Kuriyama, Katsumi, 5,068,295, Cl. 526-245.000.

Hand, William A. Aquarium hydro hi-rise and crossover bridge assembly. 5,067,439, Cl. 119-5.000.

Haney, Ronald J.: *See—*
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,067,867, Cl. 414-391.000.

Hansen, Sven K.; and Balle, Anders H., to Fredericia Cellulose A/S. Product and process for preparing a plant fiber product. 5,068,121, Cl. 426-636.000.

Hansson, Hans A.: *See—*
Fryklund, Linda; Hansson, Hans A.; Kanje, Martin; and Skottner, Anna, 5,068,224, Cl. 514-21.000.

Hao, Hsieh T.: *See—*
Blaum, Miguel M.; and Hao, Hsieh T., 5,068,858, Cl. 371-41.000.

Hara, Hiroshi: *See—*
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 5,068,742, Cl. 358-296.000.

Hara, Minoru: *See—*
Uchida, Tadahiro; Shimamura, Kuniyuki; Nogawa, Hayabu; Saito, Keikichi; and Hara, Minoru, 5,067,938, Cl. 494-12.000.

Hara, Shigeyoshi; Endo, Zen-ichiro; and Mera, Hiroshi, to Hercules Incorporated. Metathesis polymerized cross-linked copolymer. 5,068,296, Cl. 526-282.000.

Hara, Shigeyoshi; Inata, Hiroo; and Matsumura, Shunichi, to Teijin Limited. Polyamideimides containing 3,4'-diamino-diphenylether as diamine component and process for preparing the same. 5,068,307, Cl. 528-125.000.

Harada Kogyo Kabushiki Kaisha: *See—*
Kimura, Misao, 5,068,673, Cl. 343-901.000.

Harada, Toshiaki: *See—*
Goto, Hiroshi; Harada, Toshiaki; and Ishikawa, Noriyoshi, 5,068,123, Cl. 427-32.000.

Harder, Wolfgang: *See—*
Merger, Franz; Fischer, Rolf; Harder, Wolfgang; Priester, Claus-Ulrich; and Vagt, Uwe, 5,068,398, Cl. 560-156.000.

Hardesty, Lee R.; and Takagi, Izumi, to Kawasaki Jukogyo Kabushiki Kaisha; and Deere & Company. Unitized power system and vehicles employing same. 5,067,933, Cl. 475-32.000.

Hards, Graham A.: *See—*
Keck, Lindsey; Buchanan, Jeffrey; and Hards, Graham A., 5,068,161, Cl. 429-44.000.

Hardwick, Roy, to Imperial Chemical Industries PLC. Bonding metal components. 5,067,649, Cl. 228-107.000.

Hardy, Alan: *See—*
Agger, Reginald T.; Taylor, John R.; and Hardy, Alan, 5,068,143, Cl. 428-241.000.

Hargraves, Kevin D. Adjustable line block for autobodies. 5,067,216, Cl. 29-79.000.

Harkes, Douglas: *See—*
Hurnik, Frank; Jarmain, Eric; Phillips, Don; Kirkland, Michael; Harkes, Douglas; and Gordon, Donald J., 5,067,443, Cl. 119-71.000.

Harlan, Thomas A.; and Long, Joseph F. Golfer's swing analysis device. 5,067,717, Cl. 273-183.00B.

Harley, Naomi H., to New York University. Radon monitor with sealable detecting chamber. 5,068,538, Cl. 250-472.100.

Harms, Jeffrey W., to Gill Studios, Inc. Badge and mounting assembly. 5,067,265, Cl. 40-1.500.

Harnischfeger Engineers, Inc.: *See—*
Miskin, Stephen N.; and Lloyd, Kurt M., 5,067,592, Cl. 187-9.00R.

Harris, Gary L. Coin and/or token operated and handling apparatus. 5,067,928, Cl. 453-17.000.

Harris, James L.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 5,067,499, Cl. 131-194.000.

Harris, Robert F.; and Joseph, Michael D., to Dow Chemical Company, The. Process for the preparation of o-aminophenyl derivatives of aminated poly(alkylene glycols) and backbone-modified derivatives thereof. 5,068,306, Cl. 528-68.000.

Harris, William I., to Dow Chemical Company, The. Ion exchange resins prepared by sequential monomer addition. 5,068,255, Cl. 521-28.000.

Harris, William J.; Lysenko, Zenon; and Hurtig, Carl W., to Dow Chemical Company, The. Phosphate salts of AB-polybenzoxazole monomer. 5,068,384, Cl. 562-453.000.

Harrison, Colin G.; and Hortensius, Peter D., to International Business Machines Corporation. Coordination of wireless medium among a plurality of base stations. 5,068,916, Cl. 455-39.000.

Hart, Robert W. Method and apparatus for playing a presidential board game. 5,067,721, Cl. 273-243.000.

Hartemann, Frederic; Bres, Michel; and Teillard, Roger, to Thomson Tubes Electroniques. Helical wiggler device with permanent magnets for application to free electron lasers. 5,068,860, Cl. 372-2.000.

Harvard Sports, Inc.: *See—*
Dadbeh, Bemanali H., 5,067,728, Cl. 273-420.000.

Harward, Mark G.: *See—*
Mahant-Shetti, Shivaling S.; and Harward, Mark G., 5,068,825, Cl. 365-154.000.

Hasebe, Akio: *See—*
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Hasegawa, Etsuo; Kawaguchi, Akihiro; Kajitani, Makoto; Yasumoto, Mitsugi; Kasahara, Nobuo; and Yamamoto, Junji, to Taiho Pharmaceutical Company, Limited. Diazabicycloalkane derivative. 5,068,235, Cl. 514-258.000.

Haselwarter, Klaus: *See—*
Schmidhammer, Ludwig; Haselwarter, Klaus; Klaus, Hermann; and Mohr, Klaus-Peter, 5,068,475, Cl. 570-262.000.

Hasenberg, Thomas C.; and Gignac, William J., to Hughes Aircraft Company. Coupled quantum well strained superlattice structure and optically bistable semiconductor laser incorporating the same. 5,068,867, Cl. 372-45.000.

Hashiba, Takahiro; and Kaga, Kouichi, to Toyoda Gosei Co., Ltd. Steering wheel. 5,067,367, Cl. 74-552.000.

Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, to Ricoh Company, Ltd.; and Hodogaya Chemical Co., Ltd. Polyolefin derivatives. 5,068,350, Cl. 548-444.000.

Hashimoto, Susumu: *See—*
Inomata, Koichiro; and Hashimoto, Susumu, 5,068,050, Cl. 252-62.510.

Haspeslagh, Didier R.: *See—*
Rabaey, Dirk H. L. C.; and Haspeslagh, Didier R., 5,068,848, Cl. 370-85.600.

Hassell, Edwin, Jr. Sun shield for a childs car seat. 5,067,770, Cl. 297-184.000.

Hastings, Joseph A. Instrument sterilizer. 5,068,085, Cl. 422-1.000.

Hatano, Tsutomu; Kawasaki, Sohei; Hoshino, Tetsuro; and Endo, Takamitsu, to Exxon Research & Engineering Company. Method of cold rolling a metal. 5,068,049, Cl. 252-57.000.

Hatch, Newell J.: *See—*
Sorensen, Dent G.; and Hatch, Newell J., 5,067,396, Cl. 99-340.000.

Hathaway, Dana B. Polymer-filled audio loudspeaker cabinet. 5,067,583, Cl. 181-151.000.

Hatten, Allen R. G.; and Hatten, Jean. Scratching posts. 5,067,440, Cl. 119-29.000.

Hatten, Jean: *See—*
Hatten, Allen R. G.; and Hatten, Jean, 5,067,440, Cl. 119-29.000.

Hattori, Tetsuo: *See—*
Ohno, Kou; Hattori, Tetsuo; and Matsumoto, Tsuyoshi, 5,068,529, Cl. 250-231.180.

Hauch, Dennis W.; and Werner, Kurt, to Whirlpool Corporation. Lint collecting device. 5,067,253, Cl. 34-82.000.

Haug, Michael: *See—*
Andree, Roland; Haug, Michael; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,068,394, Cl. 560-56.000.

Haun, Niels; and Moore, Duncan T., to University of Rochester, The. Sol-gel method for making gradient index optical elements. 5,068,208, Cl. 501-12.000.

Hauser, Jeffrey B.: *See—*
Paspek, Stephen C.; Hauser, Jeffrey B.; Eppig, Christopher P.; and Adams, Harry A., 5,068,027, Cl. 208-125.000.

Hauslaib, Wolfgang: *See—*
Gomoll, Guenter; and Hauslaib, Wolfgang, 5,067,833, Cl. 400-213.000.

Haussling, Reinhold. Method of making a sound absorbing laminate. 5,068,001, Cl. 156-222.000.

Hawk, Robert M.: *See—*
Hall, Douglas W.; and Hawk, Robert M., 5,067,789, Cl. 385-27.000.

Hawkins, Ronald G.; and Grigsby, Richard, to BICC Public Limited Company. Optical fibre monitoring. 5,067,786, Cl. 385-13.000.

Hayami, Hiroshi: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 5,068,376, Cl. 556-137.000.

Hayashi, Kenichi: *See—*
Hagino, Sadaaki; Suzuki, Motokazu; Kondo, Hideyuki; Nishikawa, Shigeru; and Hayashi, Kenichi, 5,068,219, Cl. 505-1.000.

Hays, George F.; and Coyle, James A., to Ashland Oil Inc. Method for determining fluid corrosiveness. 5,068,196, Cl. 436-6.000.

Hayward, Christopher F.: *See—*
Camble, Roger; Cotton, Ronald; Dutta, Anand S.; and Hayward, Christopher F., 5,068,222, Cl. 514-15.000.

Hayward Industries, Inc.: *See—*
Tobias, Samuel; and Hazlehurst, Fred T., 5,068,033, Cl. 210-169.000.

Hayward, Wesley H.; and Taylor, Stewart S., to TriQuint Semiconductor, Inc. Compensation method and apparatus for enhancing single-ended to differential conversion. 5,068,621, Cl. 330-253.000.

Hazard Detection Systems: *See—*
Husher, Fredrick K., 5,068,654, Cl. 340-903.000.

Hazenbroek, Jacobus E.; and Verrijp, Bastiaan. Revolving poultry thigh deboner. 5,067,927, Cl. 452-136.000.

Hazlehurst, Fred T.: *See—*
Tobias, Samuel; and Hazlehurst, Fred T., 5,068,033, Cl. 210-169.000.

Heads, Alan: *See—*
St. Angelo, Stephen, Jr.; Lucci, John J.; Carver, George C.; Heads, Alan; and Mitchell, James F., 5,067,225, Cl. 29-451.000.

Healy, Daniel P. Pineapple cutting and coring device. 5,067,397, Cl. 99-542.000.

Heath, Warren J.; Langner, Rene J.; and Bell, Charles A., to Precision Systems, Inc. Process environment monitoring system. 5,068,798, Cl. 364-497.000.

Heckel, Armin: *See—*
Muller, Erich; Nickl, Josef, deceased; Heckel, Armin; and Engelhardt, Gunther, 5,068,334, Cl. 546-157.000.

Heeren, Evert; and Gotthelf, Hans, to Hoesch Werke AG. Method of treating refuse scrap. 5,067,659, Cl. 241-19.000.

Heinhold, Duane H.; and Heinhold, Kenneth E. Cleaning and sanitizing system for frozen dessert mixing machine. 5,067,819, Cl. 366-138.000.

Heinhold, Kenneth E.: *See—*
Heinhold, Duane H.; and Heinhold, Kenneth E., 5,067,819, Cl. 366-138.000.

Heinz, Gerhard: *See—*
Pipper, Gunter; Heinz, Gerhard; and Hisgen, Bernd, 5,068,308, Cl. 528-171.000.

Heinz, Hans-Detlef: *See—*
Horn, Klaus; Heinz, Hans-Detlef; Muller, Peter-Rolf; and Dujardin, Ralf, 5,068,311, Cl. 528-324.000.

Heinz, Jochen; Krug, Thomas; Ruebsam, Klemens; and Kessler, Hans, to Leybold Aktiengesellschaft. Series evaporator for vacuum vapor-deposition apparatus. 5,068,915, Cl. 392-389.000.

Heitmiller, Charles E., to Carrier Vibrating Equipment, Inc. Vibrating article coating and conveying apparatus. 5,067,431, Cl. 118-57.000.

Hellenguard, Hanh P.; Koth, Lawrence J.; and Vaughan, Donald T., to Du Pont de Nemours E. I., and Company. Control of sheet opacity. 5,068,796, Cl. 364-46?.000.

Helm, Randolf E.: *See—*
Wilkins, Bruce G.; and Helm, Randolf E., 5,067,545, Cl. 160-178.100.

Helmstetter, Richard C.: *See—*
Parente, Richard E.; De La Cruz, Richard; and Helmstetter, Richard C., 5,067,711, Cl. 273-77.00A.
Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., 5,067,715, Cl. 273-167.00F.

Hely, John P., to Medical Specialties, Inc. Ankle stabilizing appliance. 5,067,486, Cl. 128-80.00H.

Hemmerich, Andreas; McIntyre, David; Zimmermann, Claus; and Haensch, Theodor, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Solid state laser operating with frequency doubling and stabilized by an external resonator. 5,068,546, Cl. 359-328.000.

Hemmings, John W.; Allan, Peter; and O'Shaughnessy, Gerald M., to Aeci Limited. Purification of gases. 5,067,972, Cl. 55-40.000.

Hen, John, to Mobil Oil Corporation. Dissolution of sulfate scales. 5,068,042, Cl. 252-8.552.

Henderson, Ian D.: *See—*
Dick, Ian R.; Henderson, Ian D.; Kimpton, Gordon L.; and Wyatt, David S., 5,068,507, Cl. 219-73.110.

Hendricks, Curt J.: *See—*
Dickerson, Mack F.; Hendricks, Curt J.; and Hendricks, Gregory A., 5,067,428, Cl. 114-230.000.

Hendricks, Gregory A.: *See—*
Dickerson, Mack F.; Hendricks, Curt J.; and Hendricks, Gregory A., 5,067,428, Cl. 114-230.000.

Hendricks, Katherine A., to Tabakoff, Boris; and Newton, John, part interest to each. Anti-motion sickness apparatus. 5,067,941, Cl. 600-27.000.

Hendrix, David C., to BASF Corporation. Process for the oxidation of hydrocarbons utilizing partitioning of oxidizing gas. 5,068,464, Cl. 568-357.000.

Henkel Corporation: *See—*
Lindert, Andreas; Pierce, John R.; McCormick, David R.; and Zimmermann, William D., 5,068,299, Cl. 526-313.000.

Henneberger, Roy L.; Weitnauer, Ronald M.; and Johnson, Wayne A., to ADC Telecommunications, Inc. Optic cable management system. 5,067,678, Cl. 248-68.100.

Henning, Joergensen. Imprisoning trap. 5,067,271, Cl. 43-60.000.

Hercules Incorporated: *See—*
Bard, John K.; and Burnier, Julia S., 5,068,303, Cl. 528-25.000.
Hara, Shigeyoshi; Endo, Zen-ichiro; and Mera, Hiroshi, 5,068,296, Cl. 526-282.000.

Herent, Gerard; Mahe, Michel; and Romagny, Alex, to Regie Nationale Des Usines Renault. Auxiliary device for handling failures of an actuating system of a linear electric actuator. 5,068,584, Cl. 318-549.000.

Herlitz, Nils G.; Iglehart, Karl I.; and Sentell, John S., to Safe T.V., Inc. Video inspection system for hazardous environments. 5,068,720, Cl. 358-100.000.

Herman C. Starck Berlin GmbH & Co. KG: *See—*
Eckert, Joachim; and Bludssus, Walter, 5,068,097, Cl. 423-592.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Capelle, Gerd, 5,068,069, Cl. 264-40.500.

Herrell, Dennis J.: *See—*
Smith, Lawrence N.; Woodard, Ollie C., Sr.; and Herrell, Dennis J., 5,068,580, Cl. 315-366.000.

Herring, Samuel H., to Niagara Lockport Industries, Inc. 14 harness dual layer papermaking fabric. 5,067,526, Cl. 139-383.00A.

Herrington, F. John, Jr.; and St. Phillips, Eric A., to Mobil Oil Corporation. Plastic reclosable fastener with self-locking slider. 5,067,208, Cl. 24-400.000.

Herrington, Fox J.: *See—*
Grosz, Edward G.; Herrington, Fox J.; and St. Phillips, Eric A., 5,067,633, Cl. 221-279.000.

Herrmann, Wolfgang: *See—*
Steiner, Klaus; Herrmann, Wolfgang; Crone, Gunter; and Combs, Charles S., 5,068,413, Cl. 562-507.000.

Herzog, Kenneth. Bench top container filler. 5,067,531, Cl. 141-116.000.

Hesa S.p.A.: *See—*
Hruby, Vincenzo; and Vizzotto, Raffaele, 5,068,642, Cl. 340-562.000.

Hesske, Benno; Adnrae, Franz; and Weber, Peter, to Feinmechanische Optische Betriebsgesellschaft m.b.H. Gauge for measuring tree-trunk growth and the like. 5,067,246, Cl. 33-555.400.

Hester, Charles F.: *See—*
Clark, Rodney L.; and Hester, Charles F., 5,068,801, Cl. 395-25.000.

Hettche, Helmut: *See—*
Achterrath-Tuckerman, Ute; Aurich, Rudolf; Engel, Jurgen; Hettche, Helmut; and Kleeman, Axel, 5,068,233, Cl. 514-212.000.

Hewlett-Packard Company: *See—*
Dervisoglu, Bulent I.; and Stong, Gayvin E., 5,068,881, Cl. 377-70.000.
Lipschutz, David, 5,068,833, Cl. 367-98.000.
Woodroffe, Brian W., 5,068,879, Cl. 375-115.000.

Heyche, Albert; Latteur, Alain; and Dekoninck, Philippe, to Vigilant, Ltd. Control system for remote controlled aircraft. 5,067,674, Cl. 244-190.000.

Hi-Tek Polymers, Inc.: *See—*
Shimp, David A.; and Vanderlip, Jeffrey T., 5,068,309, Cl. 528-211.000.

Hiemstra-Paez, Carol L., to Camp International, Inc. Posture training support with weight pockets. 5,067,484, Cl. 128-78.000.

Hiernaut, Jean-Pol: *See—*
Van Geel, Jacobus; Magill, Joseph; Werner, Paul; and Hiernaut, Jean-Pol, 5,068,512, Cl. 219-121.600.

Higa, Kelvin T., to United States of America, Navy. Monomeric organometallic compounds and method of preparing same. 5,068,370, Cl. 556-19.000.

Higashi, Michiya: *See—*
Uchida, Ken; Higashi, Michiya; Kihara, Naoko; Shimozawa, Hiroshi; and Yoshizumo, Akira, 5,068,267, Cl. 523-435.000.

Higashihata, Yoshihide: *See—*
Fukada, Eiichi; Saito, Shigeru; Yagi, Toshiharu; and Higashihata, Yoshihide, 5,067,488, Cl. 128-777.000.

Higuchi, Hiroshi: *See—*
Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, 5,068,828, Cl. 365-189.010.

Higuchi, Kazuo: *See—*
Uchida, Kiyoshi; Noda, Shoji; and Higuchi, Kazuo, 5,068,871, Cl. 373-17.000.

Higuchi, Toshihiko; Nakano, Yasuhiko; Kunii, Nobuaki; Yamaguchi, Yoshiyuki; and Kozawa, Shigeyuki, to Asahi Glass Company, Ltd. Moisture-curable resin composition. 5,068,304, Cl. 528-28.000.

Hill, John A. Connector and method for use thereof. 5,067,848, Cl. 403-406.100.

Hijikata, Kenji: *See—*
Watanabe, Junji; Naka, Michiro; and Hijikata, Kenji, 5,068,052, Cl. 252-299.010.

Hilber, Walter, to Kone Oy. Procedure for horizontal storage of paper rolls. 5,067,871, Cl. 414-786.000.

Hilbert, Ferdinand, to Siemens Aktiengesellschaft. Solid electrolyte capacitor in a chip structure. 5,068,766, Cl. 361-534.000.

Hilbert, Samuel D.: *See—*
Weaver, Max A.; Pruett, Wayner P.; and Hilbert, Samuel D., 5,068,348, Cl. 548-264.400.

Hilbrands, Martin J., to Progressive Blasting Systems, Inc. Seal belt assembly for compartments in which blasting, spraying and the like operations are performed. 5,067,285, Cl. 51-426.000.

Hilby, James A.: *See—*
Grillo, John M.; Hilby, James A.; La Croix, Mark E.; Polinsky, Mark A.; and Steltzer, Gordon L., 5,067,350, Cl. 73-494.000.

Hill, Gary; Schoch, Walter K.; and Warkentien, Michael, to Sewell Plastics, Inc. Parison lubrication method. 5,068,078, Cl. 264-512.000.

Hill, Philip G.; Pierik, Ronald J.; and Hodgins, K. Bruce, to University of British Columbia, The. Intensifier-injector for gaseous fuel for positive displacement engines. 5,067,467, Cl. 123-497.000.

Hiller, Don: *See—*
Breaux, Craig B.; Cawyer, Denny; Duplantis, Dwight; and Hiller, Don, 5,067,510, Cl. 137-77.000.

Hilton, Charles B.: *See—*
Lindley, Daniel D.; Curtis, Thomas A.; Ryan, Timothy R.; de la Garza, Edward M.; Hilton, Charles B.; and Kenesson, Thomas M., 5,068,448, Cl. 568-319.000.

Hilton Nevada Corporation: *See—*
Georgilas, Michael, 5,067,712, Cl. 273-143.00R.

Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, to Siemens Aktiengesellschaft. Testing device for both-sided two-stage contacting of equipped printed circuit boards. 5,068,600, Cl. 324-158.00F.

Himmele, Walter: *See—*
Zipplies, Matthias; Sauter, Hubert; Roehl, Franz; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 5,068,245, Cl. 514-429.000.
Zipplies, Matthias; Sauter, Hubert; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 5,068,246, Cl. 514-429.000.

Himmler, Gunther; and Moench, Uwe, to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik. Rotary member measuring apparatus with improved support bed. 5,067,348, Cl. 73-460.000.

Hines, Marshall U.: *See—*
Ball, Larry K.; Hines, Marshall U.; and Tervo, John N., 5,067,506, Cl. 137-1.000.

Hinmont Incorporated: *See—*
Albizzati, Enrico; Morini, Giampiero; Giannini, Umberto; Barino, Luisa; Scordamaglia, Raimondo; Barbe, Pier C.; and Noristi, Luciano, 5,068,213, Cl. 502-126.000.

Hinsberg, William D.: *See—*
Betterton, Kathleen M.; Hinsberg, William D.; Nguyen, Huu T.; Tang, Wing T.; and Twieg, Robert J., 5,068,054, Cl. 252-299.620.

Hinsch, Robert M.: *See—*
Ryan, Dana W.; Kaiser, James M.; and Hinsch, Robert M., 5,067,945, Cl. 604-198.000.

Hinton, Mark L.; and Belka, John C., Jr., to Allied-Signal Inc. Digital blanker for scanned displays. 5,068,647, Cl. 340-734.000.

Hirabayashi, Hirokazu, to Nissan Motor Company, Ltd. Air bag system. 5,067,744, Cl. 280-734.000.

Hirakawa, Yoshiyuki: *See—*
Samejima, Masayoshi; Noda, Kazuo; Hirakawa, Yoshiyuki; and Yoshino, Hiroyuki, 5,068,112, Cl. 424-495.000.

Hirano, Hidemi: *See—*
Ban, Takeshi; Matsunaga, Shigeru; Hirano, Hidemi; Isobe, Tuguo; and Takakura, Yoshio, 5,067,555, Cl. 164-480.000.

Hirata, Kazunari: *See—*
Kawasaki, Isamu; and Hirata, Kazunari, 5,067,393, Cl. 92-186.000.

Hiratsuka, Nobuo: *See—*
Yoshida, Takashi; Kawase, Tsueno; and Hiratsuka, Nobuo, 5,068,019, Cl. 204-182.800.

Hirchert, Richard A., to Allied-Signal Inc. Method and apparatus for balancing rotating components. 5,067,349, Cl. 73-472.000.

Hiroe, Akihiko, to Ricoh Company, Ltd. Photoelectric conversion device with voltage source means. 5,068,526, Cl. 250-214.00R.

Hirofuji, Satoshi: *See—*
Negi, Taichi; Hirofuji, Satoshi; Tanaka, Nobuo; and Kawai, Syuji, 5,068,077, Cl. 264-512.000.

Hirohata, Toru: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; Suzuki, Tomoko; and Kan, Hirofumi, 5,068,815, Cl. 364-713.000.

Hironaka, Misao: *See—*
Yagi, Tetsuya; and Hironaka, Misao, 5,068,870, Cl. 372-50.000.

Hirose, Kazunori: *See—*
Nishio, Yukio; and Hirose, Kazunori, 5,068,691, Cl. 355-259.000.

Hirschberg, Bruno: *See—*
Lepoutre, Etienne; Devaux, Michel; Hirschberg, Bruno; Petio, Franz A.; and Weitzer, Paul, 5,067,693, Cl. 266-44.000.

Hisada, Haruhiko: *See—*
Ogawa, Yoshikatsu; Hisada, Haruhiko; Kasahara, Takeshi; Kizaki, Fumihiko; and Yoshiya, Masahide, 5,068,446, Cl. 568-33.000.

Hisada, Hidenori; and Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus using mask members and having monochromatic printer portion and manual mask member insertion tray. 5,068,685, Cl. 355-32.000.

Hisgen, Bernd: *See—*
Pipper, Gunter; Heinz, Gerhard; and Hisgen, Bernd, 5,068,308, Cl. 528-171.000.

Hitachi Babcock Kabushiki-kaisha: *See—*
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Taneichi, Yoshio; and Fujiwara, Yukinari, 5,068,624, Cl. 330-293.000.

Hitachi, Ltd.: *See—*
—Ban, Takeshi; Matsunaga, Shigeru; Hirano, Hidemi; Isobe, Tuguo; and Takakura, Yoshio, 5,067,555, Cl. 164-480.000.
—Futamoto, Masaaki; Honda, Yukio; and Yoshida, Kazuetsu, 5,068,158, Cl. 428-694.000.
—Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.
—Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, 5,068,828, Cl. 365-189.010.
—Miyashita, Koujirou; and Machida, Tetsuo, 5,068,802, Cl. 395-133.000.
—Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.
—Owada, Nobuo; Horiuchi, Mitsuaki; Tsuneoka, Masatoshi; and Taneoka, Tadayuki, 5,068,710, Cl. 357-71.000.
—Satoh, Yutaka, 5,068,732, Cl. 358-180.000.
—Tanaka, Masakatsu; Itoh, Masanobu; Arabori, Noboru; Nara, Toshihiko; Takahashi, Tastuhiko; Masuda, Katutaro; and Saito, Mitsuo, 5,067,593, Cl. 187-73.000.

Watanabe, Tan; Nishino, Hideki; Iwami, Hidefumi; and Tabata, Kuniaki, 5,068,804, Cl. 395-147.000.

Yamaguchi, Yasunori; and Miyake, Jun, 5,068,829, Cl. 365-189.070.

Yasunaga, Moritoshi; Masuda, Noboru; Todokoro, Hideo; Umemoto, Yasunari; Tanaka, Hirotoshi; and Itoh, Hiroyuki, 5,068,605, Cl. 324-158.00R.

Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Hitachi Maxell, Ltd.: *See—*
Kitakami, Osamu; Fujiwara, Hideo; Ojima, Kiyotaka; Ogawa, Youichi; and Wakai, Kunio, 5,068,144, Cl. 428-323.000.
Maro, Tsuyoshi; Kitakami, Osamu; and Fujiwara, Hideo, 5,068,152, Cl. 428-408.000.

Hitachi Metals International, Ltd.: *See—*
Ribitch, Raymond, 5,067,990, Cl. 148-262.000.

Hitachi Metals, Ltd.: *See—*
Nagamatsu, Hiromitsu; and Ueda, Seitaro, 5,067,931, Cl. 474-162.000.

Hitachi Micro Computor Engineering Kabushiki Kaisha: *See—*
Takeuchi, Shigeru; Murayama, Takayuki; Horiguchi, Motokuni; and Hukunaga, Masami, 5,067,904, Cl. 439-73.000.

Hitachi Microcomputer Engineering, Ltd.: *See—*
Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, 5,068,828, Cl. 365-189.010.
Miyashita, Koujirou; and Machida, Tetsuo, 5,068,802, Cl. 395-133.000.

Hitch, Brenda J.: *See—*
Sumner, Charles E., Jr.; Hitch, Brenda J.; and Bernard, Bobby L., 5,068,460, Cl. 568-648.000.

Hitoshi, Tarukawa: *See—*
Mamoru, Takeichi; Naoshi, Hagihara; Hitoshi, Tarukawa; Tawaki, Shinichirou; and Makiguchi, Nobuyoshi, 5,068,187, Cl. 435-106.000.

Hitotsumachi, Shuzo: *See—*
Tanaka, Hiroshi; Ishiwata, Tetsuo; Hitotsumachi, Shuzo; Komae, Hitoshi; Yamaguchi, Susumu; Yoshino, Tadashi; and Yamauchi, Eiji, 5,068,752, Cl. 360-32.000.

Hjorth, Bo: *See—*
Ohlsson, Thomas; and Hjorth, Bo, 5,068,658, Cl. 341-131.000.

Ho, Suzzy C.: *See—*
Wu, Margaret M.; and Ho, Suzzy C., 5,068,476, Cl. 585-12.000.

Hobbs, Sheila H., to Warner-Lambert Company. Substituted furans and derivatives thereof acting at muscarinic receptors. 5,068,237, Cl. 514-365.000.

Hobbs, Stanley Y.: *See—*
Campbell, John R.; Shea, Timothy J.; Hobbs, Stanley Y.; and Brown, Sterling B., 5,068,286, Cl. 525-92.000.

Hochmuth, Harald: *See—*
Ritter, Joachim; and Hochmuth, Harald, 5,067,598, Cl. 192-7.000.

Hock, Donald E.: *See—*
Francik, Charles A.; Fleming, Harry A., Jr.; and Hock, Donald E., 5,067,295, Cl. 52-306.000.

Hock, Franz: *See—*
Nickel, Wolf-Ulrich; Ruger, Wolfgang; Urbach, Hansjorg; and Hock, Franz, 5,068,242, Cl. 514-412.000.

Hodgins, K. Bruce: *See—*
Hill, Philip G.; Pierik, Ronald J.; and Hodgins, K. Bruce, 5,067,467, Cl. 123-497.000.

Hodogaya Chemical Co., Ltd.: *See—*
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 5,068,350, Cl. 548-444.000.

Hoechst Aktiengesellschaft: *See—*
Elsaesser, Andreas; Frass, Werner; and Mohr, Dieter, 5,068,163, Cl. 430-192.000.
Miess, Georg-Emerich; Schwarz, Karl-Heinz; Tetzlaff, Heribert; and Wojtech, Bernhard, 5,068,358, Cl. 548-555.000.
Nickel, Wolf-Ulrich; Ruger, Wolfgang; Urbach, Hansjorg; and Hock, Franz, 5,068,242, Cl. 514-412.000.
Paul, Norbert; Huber, Rudolf; and Mielke, Ingolf, 5,068,471, Cl. 570-139.000.
Schlingmann, Merten; Keller, Reinhold; Wiesner, Matthias; Treder, Wolfgang; and Thiem, Joachim, 5,068,186, Cl. 435-96.000.
Teetz, Volker; Wissmann, Hans; and Urbach, Hansjorg, 5,068,351, Cl. 548-452.000.
von Werner, Konrad; and Probst, Anton, 5,068,415, Cl. 562-541.000.

Hoechst Celanese Corporation: *See—*
Brown, David M.; and Potvin, Robert E., 5,068,319, Cl. 534-759.000.
Lindley, Daniel D.; Curtis, Thomas A.; Ryan, Timothy R.; de la Garza, Edward M.; Hilton, Charles B.; and Kenesson, Thomas M., 5,068,448, Cl. 568-319.000.

Hoegberg, Lon; and Maddali, Vijay, to Sundstrand Corporation. Speed control for electrical generating system. 5,068,591, Cl. 322-29.000.

Hoesch Werke AG: *See—*
Heeren, Evert; and Gotthelf, Hans, 5,067,659, Cl. 241-19.000.

Hoffa, Gary. Fish aquarium. 5,067,438, Cl. 119-5.000.

Hoffman, Eldon P.: *See—*
Van Horne, Arthur C.; Hoffman, Eldon P.; and Bakke, Paul D., 5,067,705, Cl. 271-277.000.

Hofland, Robert, Jr.: *See—*
Mirels, Harold; Spencer, Donald J.; and Hofland, Robert, Jr., 5,067,801, Cl. 359-666.000.

Hofmann, Kathryn J.: *See—*
Hopper, James E.; Schultz, Loren D.; Hofmann, Kathryn J.; and Ellis, Ronald W., 5,068,185, Cl. 435-69.100.

Hogen Esch, Johannes H. L., to N.V. Nederlandsche Apparatenfabriek Nedap. Detection label for an anti-shop-lifting system. 5,068,641, Cl. 340-551.000.

Hohlein, Peter: *See—*
Meixner, Jurgen; Pedain, Josef; Hohlein, Peter; and Kreuder, Hans-Joachim, 5,068,305, Cl. 528-49.000.

Holdenried, Willy, to Zahnradfabrik Friedrichshafen AG. Control device. 5,067,362, Cl. 74-335.000.

Holder, Michael D. Battering ram. 5,067,237, Cl. 30-1.000.

Hollenbeck, Martha D.: *See—*
Lewis, Jack A.; Lumsden, Douglas; Papavizas, George; Hollenbeck, Martha D.; and Walter, James F., 5,068,105, Cl. 424-93.000.

Hollibush, Daniel J.; Fasnacht, Jeffery; and Eeg, Edward G., to Ortho-Vacon, Inc. Polymeric orthodontic members and orthodontic treatment method. 5,068,107, Cl. 424-435.000.

Hollinger, Karl: *See—*
Sajtos, Alexander; Kloimstein, Engelbert; Hollinger, Karl; and Farnlettner, Lorenz, 5,068,417, Cl. 562-577.000.

Hollmann, Frank P., to Peter Wolters AG. Card clothing. 5,067,203, Cl. 19-114.000.

Hollmann, Hans-Gunter: *See—*
McConchie, Garnet E.; Mark, Frank E.; and Hollmann, Hans-Gunter, 5,068,401, Cl. 560-236.000.

Holtmyer, Marlin; and Hunt, Charles V., to Halliburton Company. Crosslinkable cellulose derivatives. 5,067,565, Cl. 166-305.100.

Holzhauer, Juergen K.; Brown, Albert P.; and Reeve, Aubrey C., to Amoco Corporation. Compartmented oxidation method. 5,068,406, Cl. 562-413.000.

Honcia, Gunter: *See—*
Schildknecht, Manfred; and Honcia, Gunter, 5,067,409, Cl. 102-476.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kamimura, Kenji; and Tsuzuki, Sadachika, 5,068,795, Cl. 364-449.000.
Sakai, Ichiro; Arai, Yasuhisa; Yamamoto, Masataka; and Matsui, Hiroki, 5,067,374, Cl. 74-866.000.
Ueno, Tsugio; Sato, Masato; and Mori, Yoshiaki, 5,067,231, Cl. 29-809.000.

Honda, Yukio: *See—*
Futamoto, Masaaki; Honda, Yukio; and Yoshida, Kazuetsu, 5,068,158, Cl. 428-694.000.

Honegger, Werner, to Ferag AG. Method and means for tabloid further processing. 5,067,697, Cl. 270-37.000.

Honeywell Inc.: *See—*
Gold, Ronald S.; and Jachimowicz, Karen E., 5,067,799, Cl. 359-490.000.
Kulkarni, Milind V., 5,068,162, Cl. 429-116.000.
Martwick, Wilford E., 5,067,407, Cl. 102-434.000.
Martwick, Wilford E., 5,067,408, Cl. 102-434.000.
Stout, James C., 5,068,847, Cl. 359-118.000.

Honma, Ko: *See—*
Ishikawa, Haruo; Kawana, Kiyoshi; Honma, Ko; and Yoshikawa, Takashi, 5,068,537, Cl. 250-342.000.

Honshu Paper Co., Ltd.: *See—*
Tsuchiya, Mikio; Kawase, Shoichi; and Watanabe, Hirofumi, 5,067,612, Cl. 206-497.000.

Honshu Sangyou Kabushiki Kaisha: *See—*
Tsuchiya, Mikio; Kawase, Shoichi; and Watanabe, Hirofumi, 5,067,612, Cl. 206-497.000.

Hooykaas, Carel W. J., to Pelt & Hooykaas B.V. Method for rendering toxic waste harmless. 5,067,981, Cl. 106-790.000.

Hoppe, Joseph, to U.S. Philips Corp. Method of generating a unique number for a smart card and its use for the cooperation of the card with a host system. 5,068,894, Cl. 380-23.000.

Hopper, James E.; Schultz, Loren D.; Hofmann, Kathryn J.; and Ellis, Ronald W., to Merck & Co., Inc. Trains of yeast for the expression of heterologous genes. 5,068,185, Cl. 435-69.100.

Hori, Tohru; Aoki, Masaki; and Fujii, Kenichi, to Matsushita Electric Industrial Co., Ltd. Soft magnetic thin film comprising alternate layers of iron carbide with either iron, iron nitride or iron carbonnitride. 5,068,147, Cl. 428-336.000.

Horiba, Ltd.: *See—*
Suzuki, Riichiro; Akiyama, Shigeyuki; and Kubo, Yoshihiro, 5,067,814, Cl. 356-339.000.

Horiguchi, Motokuni: *See—*
Takeuchi, Shigeru; Murayama, Takayuki; Horiguchi, Motokuni; and Hukunaga, Masami, 5,067,904, Cl. 439-73.000.

Horinouchi, Kazuo; Mouri, Masahide; and Kameda, Isao, to Sumitomo Chemical Company, Limited. Electrically conductive zirconia-based sintered body and process for the production thereof. 5,068,072, Cl. 264-66.000.

Horio, Yoshihiro: *See—*
Inukai, Sinji; Agata, Mitsuzi; Umezawa, Manami; Horio, Yoshihiro; Ootake, Yasuhiro; Sawaki, Shohei; and Goto, Masayoshi, 5,068,239, Cl. 514-381.000.

Horiuchi, Mitsuaki: *See—*
Owada, Nobuo; Horiuchi, Mitsuaki; Tsuneoka, Masatoshi; and Taneoka, Tadayuki, 5,068,710, Cl. 357-71.000.

Horiuchi, Tatsuo; and Kurokawa, Toshiko, to Noda Institute for Scientific Research. N-acetylhexosamine-dehydrogenase, process for pro-

ducing same, method for the quantitative analysis of N-acetylglucosamine or N-acetylgalactosamine using same and kit for use in the quantitative analysis. 5,068,190, Cl. 435-190.000.

Horlacher, Peter; Serini, Volker; Freitag, Dieter; Grigo, Ulrich; Idel, Karsten-Josef; and Westeppe, Uwe, to Bayer Aktiengesellschaft. Polysiloxane-polycarbonate block copolymers based on certain dihydroxydiphenylcycloalkanes. 5,068,302, Cl. 528-21.000.

Horn, Klaus; Heinz, Hans-Detlef; Muller, Peter-Rolf; and Dujardin, Ralf, to Bayer Aktiengesellschaft. High molecular weight (co)polyamide from diamino-alcohol. 5,068,311, Cl. 528-324.000.

Horner, Patrick J.: *See*—
Gors, Heinrich C.; Horner, Patrick J.; and Jansons, Viktors, 5,068,447, Cl. 568-309.000.

Horng, Liou-Liang, to Monsanto Company. Chemical process. 5,068,421, Cl. 562-583.000.

Horodysky, Andrew G.: *See*—
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 5,068,045, Cl. 252-32.007.

Hortensius, Peter D.: *See*—
Harrison, Colin G.; and Hortensius, Peter D., 5,068,916, Cl. 455-39.000.

Hosaka, Akihito, to Canon Kabushiki Kaisha. Toner density sensor in close proximity to the regulating blade. 5,067,435, Cl. 118-653.000.

Hosaka, Hiroshi, to Fuji Jukogyo Kabushiki Kaisha. System and method for computing asynchronous interrupted fuel injection quantity for automobile engines. 5,068,794, Cl. 364-431.050.

Hoshi, Satoru; Masuda, Masami; and Kawaguchi, Takayuki, to Kabushiki Kaisha Toshiba. Data read circuit for semiconductor storage device. 5,068,831, Cl. 365-203.000.

Hoshi, Tadahide: *See*—
Nakagawa, Akio; Imamura, Kaoru; Sato, Ryo; and Hoshi, Tadahide, 5,068,704, Cl. 357-38.000.

Hoshino, Tetsuro: *See*—
Hatano, Tsutomu; Kawasaki, Sohei; Hoshino, Tetsuro; and Endo, Takamitsu, 5,068,049, Cl. 252-57.000.

Hoshino, Yukio: *See*—
Fujita, Tetsuro; Ikumoto, Takeshi; Sasaki, Shigeo; Kenji, Chiba; and Hoshino, Yukio, 5,068,247, Cl. 514-440.000.

Hosiden Corporation: *See*—
Ukai, Yasuhiro; Sunata, Tomihisa; Yukawa, Teizou; and Inada, Toshiya, 5,068,748, Cl. 359-59.000.

Hosmer, Christopher E.; and Whaley, John F., to Marshall and Williams Company. Tenter frame apparatus and method. 5,067,214, Cl. 26-89.000.

Hosokawa, Hiroshi: *See*—
Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 5,068,746, Cl. 358-443.000.

Hotto, Robert: *See*—
Klausner, Judah; and Hotto, Robert, 5,068,838, Cl. 368-47.000.

Howa Machinery Ltd.: *See*—
Shinkai, Kunio; Suzuki, Toyoo; Nomura, Yukitaka; Kurachi, Yoshio; and Kureishi, Hiroyuki, 5,067,204, Cl. 19-159.00A.

Howard, Jerry L., to Eldec Corporation. Component mounting frame. 5,067,917, Cl. 439-890.000.

Howe, Kenneth J. Cement mixer system. 5,067,818, Cl. 366-46.000.

Howell, Gary W.; Irr, Joseph D.; and Nahapetian, Ara T., to Du Pont Merck Pharmaceutical Company. Dot matrix membrane cell expansion and maintenance vessel. 5,068,195, Cl. 435-284.000.

Hozoji, Hiroshi: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

HPO Hanseatische Prazisions-und Orbittechnik GmbH: *See*—
Netzel, Karl-Hermann, 5,067,282, Cl. 51-165.770.

Hruby, Vincenzo; and Vizzotto, Raffaele, to Hesa S.p.A. Alarm or warning device with sensing means in the form of a D.C. biased shielded coaxial cable. 5,068,642, Cl. 340-562.000.

Hsin, Wei: *See*—
Wang, Shing C.; Ogura, Mutsuo; Wang, Shyh; and Hsin, Wei, 5,068,869, Cl. 372-45.000.

Hsu, Shih C. Three dimensional multi-coating process. 5,068,012, Cl. 204-8.000.

Hu, Feng-Kang; Lau, Chung M.; Yang, Kevin; Zhu, Joshau S.; Shen, Peter S.; and Jednacz, Thomas C., to Electronic Ballast Technology, Inc. Remote control of fluorescent lamp ballast using power flow interruption coding with means to maintain filament voltage substantially constant as the lamp voltage decreases. 5,068,576, Cl. 315-291.000.

Huang, Ali; Tsai, Philips; and Chen, Bonbo, to Acer Incorporated. Copy holder. 5,067,681, Cl. 248-442.200.

Huang, DaXu. Motor conversion mechanism utilizing elastic action. 5,068,565, Cl. 310-328.000.

Hubbell Incorporated: *See*—
Favalora, Mark L., 5,068,496, Cl. 174-65.00R.

Huber, Rudolf: *See*—
Paul, Norbert; Huber, Rudolf; and Mielke, Ingolf, 5,068,471, Cl. 570-139.000.

Huddleston, Brent D., to Micron Technology, Inc. Circuit board support apparatus for use with circuit board lead trimmer. 5,067,695, Cl. 269-21.000.

Huegin, Walter: *See*—
Spohr, Horst; and Huegin, Walter, 5,067,544, Cl. 160-177.000.

Huellmann, Michael; Mayr, Herbert; and Becker, Rainer, to BASF Aktiengesellschaft. Preparation of 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetra-hydronaphthalene. 5,068,479, Cl. 585-411.000.

Huels Aktiengesellschaft: *See*—
Balzer, Dieter; Reimer, Heinz; and Friedrich, Werner, 5,068,422, Cl. 562-587.000.
Rauleder, Hartwig; and Kotzch, Hans-Joachim, 5,068,382, Cl. 556-495.000.

Huerta, Joseph: *See*—
Olson, Donald N.; and Huerta, Joseph, 5,067,406, Cl. 102-374.000.

Hughes Aircraft Company: *See*—
Cook, Lacy G.; and Wheeler, Bryce A., 5,068,750, Cl. 359-399.000.
Fong, Herbert S., 5,067,673, Cl. 244-165.000.
Hasenberg, Thomas C.; and Gignac, William J., 5,068,867, Cl. 372-45.000.
Jackson, David P., 5,068,040, Cl. 210-748.000.
LoStracco, Gregory; and LeCompte, George W., 5,067,665, Cl. 242-118.320.
Tsuda, George I.; and Snyder, Dan E., 5,068,668, Cl. 342-362.000.

Hughes, John R. Dental x-ray alignment device. 5,068,887, Cl. 378-170.000.

Hughes, Timothy C.; and Georgis, Steven P., to Exabyte Corporation. Servo tracking for helical scan recorder. 5,068,757, Cl. 360-77.130.

Hui, Benjamin C.: *See*—
Kanjolia, Ravindra K.; and Hui, Benjamin C., 5,068,372, Cl. 556-70.000.

Hukunaga, Masami: *See*—
Takeuchi, Shigeru; Murayama, Takayuki; Horiguchi, Motokuni; and Hukunaga, Masami, 5,067,904, Cl. 439-73.000.

Humiston, Robert R. Seam knife for dry wall. 5,067,889, Cl. 425-458.000.

Hunt, Charles V.: *See*—
Holtmyer, Marlin; and Hunt, Charles V., 5,067,565, Cl. 166-305.100.

Hunter, Dave H.; Lauck, Kenneth L.; White, Kevin A.; Milne, Robert J.; Doolin, Leonard J.; and Poulin, Stephen V., to United Technologies Corporation. Composite scissors for a swashplate. 5,067,875, Cl. 416-114.000.

Hunter, Gary W.; and Leeper, Robert L. Block stacking game apparatus. 5,067,729, Cl. 273-450.000.

Hunter, Ian W., to Royal Institution for the Advancement of Learning (McGill University), The. Gas jet actuator using coanda effect. 5,067,509, Cl. 137-14.000.

Hunziker, Bruno; and Kunz, Peter, to Georg Fischer AG. Ball cock. 5,067,691, Cl. 251-315.000.

Hupp, John M.: *See*—
Bartek, Joseph P.; Brazdil, James F., Jr.; Hupp, John M.; and Grasselli, Robert K., 5,068,215, Cl. 502-208.000.

Hurnaus, Rudolf: *See*—
Grell, Wolfgang; Hurnaus, Rudolf; Reiffen, Manfred; Sauter, Robert; Pichler, Ludwig; Kobinger, Walter; Entzeroth, Michael; Mierau, Joachim; and Schingnitz, Gunter, 5,068,325, Cl. 514-215.000.

Hurnik, Frank; Jarmain, Eric; Phillips, Don; Kirkland, Michael; Harkes, Douglas; and Gordon, Donald J., to Farmatic, Inc. Mechanical nursing device for neonatal piglets. 5,067,443, Cl. 119-71.000.

Hurtig, Carl W.: *See*—
Harris, William J.; Lysenko, Zenon; and Hurtig, Carl W., 5,068,384, Cl. 562-453.000.

Hus, In-Shek: *See*—
Collins, Oliver; Dolinar, Samuel J., Jr.; Hus, In-Shek; Bozzola, Fabrizio P.; Olson, Erlend M.; Statman, Joseph I.; and Zimmerman, George A., 5,068,859, Cl. 371-43.000.

Husher, Fredrick K., to Hazard Detection Systems. Collision avoidance system. 5,068,654, Cl. 340-903.000.

Husler, Rinaldo: *See*—
Steiner, Eginhard; Beyeler, Harry; and Husler, Rinaldo, 5,068,371, Cl. 556-53.000.

Hutcherson, James: *See*—
Ishikawa, Kiichirou; Dudek, Chet; and Hutcherson, James, 5,067,424, Cl. 112-307.000.

Hutcheson, Robert E. Cushioning impact structure for footwear. 5,067,255, Cl. 36-43.000.

Huxley, Alica; Kunz, Walter; Ackermann, Peter; and Sutter, Marius, to Ciba-Geigy Corporation. Microbicidal compositions. 5,068,359, Cl. 549-58.000.

Hwang, Chong S.: *See*—
Wang, Lawrence K.; Wang, Mu H. S.; Hwang, Chong S.; and Rhow, Harold, 5,068,031, Cl. 210-96.100.

Hwang, Deng R.; and Scott, Mary Ellen A., to Technicon Instruments Corporation. Substrates for β-galactosidase. 5,068,180, Cl. 435-7.920.

Hyde, James P.; and Bryans, Thomas J., to Ford Motor Company. Heat shield retainer. 5,067,575, Cl. 180-69.400.

Hydundae Enviroment Energy Mgmt. Corp., Ltd.: *See*—
Chang, Ha Y., 5,067,974, Cl. 55-223.000.

Iazzi, Nadia: *See*—
Crotti, Pier L.; and Iazzi, Nadia, 5,068,202, Cl. 437-67.000.

Ichikawa, Souji, to Mitutoyo Corporation. Optical encoder. 5,067,816, Cl. 356-373.000.

Ichinohe, Shoji: *See*—
Kawamoto, Hideyuki; Ichinohe, Shoji; and Tsubone, Kazuyuki, 5,068,377, Cl. 556-418.000.

Ichitani, Masahiro: *See*—
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Locke, Thomas P., 5,068,852, Cl. 371-16.200.

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Archibald, John L.; Ward, Terence J.; and Opalko, Albert, 5,068,337, Cl. 514-256.000.

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Kammuri, Yoshihiro: *See*—
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Kando, Yasuhiko: *See*—
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Kanegae, Masahide, to Fujitsu Limited. Data reproducing circuit for memory system having an equalizer generating two different equalizing signals used for data reproduction. 5,068,753, Cl. 360-46.000.
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Choe, Young K.; Yang, Jeon W.; Lee, Jin H.; Lee, Jae S.; Shim, Kyu H.; and Kang, Jin Y., 5,068,884, Cl. 378-119.000.
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Kasagi, Masao: *See*—
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Kasahara, Nobuo: *See*—
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Kasahara, Takeshi: *See*—
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Kasai, Masaji: *See*—
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Kasano, Akira: *See*—
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Kato, Hisataka; and Takahashi, Satoshi, to Toyo Radiator Co., Ltd. Method for joining heat exchanger tubes with headers. 5,067,235, Cl. 29-890.043.

Kato, Kouichi: *See*—
Umeda, Toru; Kondo, Hidetaka; and Kato, Kouichi, 5,068,769, Cl. 362-61.000.

Kato, Nobuyuki; Habuchi, Ryoji; Morisawa, Kunio; and Itoh, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling hydraulically operated clutch in vehicle transmission system, including two valves for engaging and disengaging the clutch. 5,067,603, Cl. 192-0.076.

Kato, Takashi: *See*—
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Katznelson, Ron D.; and Krause, Edward A., to General Instrument Corporation. Compatible extended-definition television. 5,068,729, Cl. 358-141.000.

Kavan, Franz: *See*—
Searcy, Gus; and Kavan, Franz, 5,068,900, Cl. 381-43.000.

Kawabe, Shinji: *See*—
Kiuchi, Naoyuki; Fujimaru, Masanori; Nakagawa, Susumu; Taguchi, Eiji; Kasagi, Masao; Kimura, Akio; and Kawabe, Shinji, 5,067,413, Cl. 104-168.000.

Kawagoe, Toshiyuki: *See*—
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,068,081, Cl. 376-261.000.

Kawaguchi, Akihiro: *See*—
Hasegawa, Etsuo; Kawaguchi, Akihiro; Kajitani, Makoto; Yasumoto, Mitsugi; Kasahara, Nobuo; and Yamamoto, Junji, 5,068,235, Cl. 514-258.000.

Kawaguchi, Kenji: *See*—
Maekawa, Shigeki; Yamashita, Mikio; Kawaguchi, Kenji; and Kobayashi, Yuji, 5,067,550, Cl. 164-120.000.

Kawaguchi, Takayuki: *See*—
Hoshi, Satoru; Masuda, Masami; and Kawaguchi, Takayuki, 5,068,831, Cl. 365-203.000.

Kawahara, Masafumi; Bowman, George A.; and Matthews, Joseph B., to Sharp Kabushiki Kaisha; and Baxter International Inc. Steeping motor driving apparatus. 5,068,586, Cl. 318-696.000.

Kawai, Akira; and Murakami, Yoshihide, to Mitsubishi Paper Mills Limited. Emulsifier for microcapsules, microcapsules using said emulsifier and process for producing such microcapsules, and non-carbon pressure-sensitive copying paper using said microcapsules. 5,068,067, Cl. 264-4.700.

Kawai, Kiyoyuki: *See*—
Ogawa, Yoshihiko; Yasuki, Seijiro; and Kawai, Kiyoyuki, 5,068,725, Cl. 358-135.000.

Kawai, Masayasu, to Kyowa Electronic Instruments Co., Ltd. Torque transducer and torque measuring device. 5,067,354, Cl. 73-862.340.

Kawai, Sueo: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Kawai, Syuji: *See*—
Negi, Taichi; Hirofuji, Satoshi; Tanaka, Nobuo; and Kawai, Syuji, 5,068,077, Cl. 264-512.000.

Kawakami, Osamu: *See*—
Iwamoto, Katsuharu; Kawakami, Osamu; and Miyagawa, Hideo, 5,068,527, Cl. 250-227.210.

Kawakami, Takashi: *See*—
Nakamura, Nobuyuki; Sakamoto, Yuji; Kawakami, Takashi; and Ohkubo, Shinya, 5,067,229, Cl. 29-566.100.

Kawamata, Fumihiko: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Ogino, Masayuki; Miyagawa, Hitoshi; Kamata, Toshio; Watanabe, Mitsuo; and Miyashita, Kunihiro, 5,067,653, Cl. 239-18.000.

Kawamoto, Hideyuki; Ichinohe, Shoji; and Tsubone, Kazuyuki, to Shin-Etsu Chemical Co., Ltd. Betaine-containing siloxane compounds and method for making. 5,068,377, Cl. 556-418.000.

Kawana, Kiyoshi: *See*—
Ishikawa, Haruo; Kawana, Kiyoshi; Honma, Ko; and Yoshikawa, Takashi, 5,068,537, Cl. 250-342.000.

Kawanishi, Masaki: *See*—
Kokubo, Kouichi; Tagawa, Shinichi; Kawanishi, Masaki; Sato, Kunihito; Buma, Shuuichi; Yonekawa, Takashi; and Aburaya, Toshio, 5,067,743, Cl. 280-707.000.

Kawasaki, Isamu; and Hirata, Kazunari, to Atsugi Motor Parts Company Limited. Piston head block for internal combustion engine. 5,067,393, Cl. 92-186.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hardesty, Lee R.; and Takagi, Izumi, 5,067,933, Cl. 475-32.000.

Kawasaki, Masahiro; and Sato, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Rear converter for interchangeable lens camera. 5,068,680, Cl. 354-286.000.

Kawasaki, Sohei: *See*—
Hatano, Tsutomu; Kawasaki, Sohei; Hoshino, Tetsuro; and Endo, Takamitsu, 5,068,049, Cl. 252-57.000.

Kawasaki Steel Corporation: *See*—
Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, 5,067,979, Cl. 75-243.000.

Kawase, Shoichi: *See*—
Tsuchiya, Mikio; Kawase, Shoichi; and Watanabe, Hirofumi, 5,067,612, Cl. 206-497.000.

Kawase, Tsueno: *See*—
Yoshida, Takashi; Kawase, Tsueno; and Hiratsuka, Nobuo, 5,068,019, Cl. 204-182.800.

Kawashima, Masato: *See*—
Nagakura, Masanao; and Kawashima, Masato, 5,068,693, Cl. 355-315.000.

Kawate, Keith W.; Berthold, James P.; and Margolis, Robert M. Two wire modulated output current circuit for use with a magnetoresistive bridge speed/position sensor. 5,068,606, Cl. 324-174.000.

Kawate, Keith W.: *See*—
Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 5,068,589, Cl. 322-7.000.

Kawauchi, Yoshikazu: *See*—
Tomii, Kaoru; Miyama, Hiroshi; and Kawauchi, Yoshikazu, 5,068,579, Cl. 315-366.000.

Kawazi, Toshikuni; Ono, Masahiro; and Inoue, Nobuko, to Teikoku Seiyaku Kabushiki Kaisha; and Chiesi Farmaceutici S.p.A. Salbutamol-containing plaster and method of producing same. 5,068,103, Cl. 424-81.000.

Kayaki, Keiichi, to Yoshida Kogyo K.K. Surface-type fastener. 5,067,210, Cl. 24-452.000.

Kazan, John; and Kelly, James J., to American Cyanamid Company. Process for producing 2-(p-chlorophenoxy) aniline. 5,068,437, Cl. 564-417.000.

Kearney, Mark B.; Koglin, Dennis M.; and Michael, Jeffrey A., to Delco Electronics Corporation. Adjustable temperature dependent current generator. 5,068,595, Cl. 323-316.000.

Keck, Lindsey; Buchanan, Jeffrey; and Hards, Graham A., to Johnson Matthey Public Limited Company. Catalyst material. 5,068,161, Cl. 429-44.000.

Keen, Billy J., Jr.: *See*—
Wheless, Jack C.; Keen, Billy J., Jr.; and Ritt, Renzer R., Sr., 5,067,498, Cl. 131-88.000.

Keith, Malcolm E., to Midaco Corporation. Automatic pallet centering device. 5,067,703, Cl. 271-164.000.

Keller, John A., Jr.: *See*—
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 5,068,045, Cl. 252-32.007.

Keller, Reinhold: *See*—
Schlingmann, Merten; Keller, Reinhold; Wiesner, Matthias; Treder, Wolfgang; and Thiem, Joachim, 5,068,186, Cl. 435-96.000.

Kellner, Carl S.; Rao, V. N. Mallikarjuna; and Weigert, Frank J., to Du Pont de Nemours, E. I., and Company. Hydrogenolysis/dehydrohalogenation process. 5,068,473, Cl. 570-176.000.

Kelly, James J.: *See*—
Kazan, John; and Kelly, James J., 5,068,437, Cl. 564-417.000.

Kelman, Charles D.; and DeVore, Dale P., to Autogenesis Technologies, Inc. Non-biodegradable two phase corneal implant and method for preparing same. 5,067,961, Cl. 623-5.000.

Kenesson, Thomas M.: *See*—
Lindley, Daniel D.; Curtis, Thomas A.; Ryan, Timothy R.; de la Garza, Edward M.; Hilton, Charles B.; and Kenesson, Thomas M., 5,068,448, Cl. 568-319.000.

Kenji, Chiba: *See*—
Fujita, Tetsuro; Ikumoto, Takeshi; Sasaki, Shigeo; Kenji, Chiba; and Hoshino, Yukio, 5,068,247, Cl. 514-440.000.

Kennametal Inc.: *See*—
D'Angelo, Mark D., 5,067,775, Cl. 299-86.000.
Stiffler, Stephen P.; Beach, Wayne H.; and Frost, Robert L., 5,067,262, Cl. 37-142.00R.

Keramont Italia S.p.A.: *See*—
Giunchi, Giovanni; Savrun, Ender; Grenni, Alberto; and Chen, Ching-Fong, 5,068,211, Cl. 501-98.000.

Kerger, Leon: *See*—
Kremer, Paul; and Kerger, Leon, 5,067,520, Cl. 137-614.200.

Keritsis, Gus D., to Philip Morris Incorporated. Container for additive materials for smoking articles. 5,067,500, Cl. 131-335.000.

Kessler, Hans: *See*—
Heinz, Jochen; Krug, Thomas; Ruebsam, Klemens; and Kessler, Hans, 5,068,915, Cl. 392-389.000.

Kettunen, Jukka: *See*—
Jokinen, Olli; Kettunen, Jukka; Lepo, Jarkko; Niemi, Tapio; and Laine, Jaakko E, 5,068,009, Cl. 162-9.000.

Khambay, Bhupinder P. S.: *See*—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 5,068,403, Cl. 562-7.000.

Khan, Shahid H. Lipstick key chain attachment. 5,067,836, Cl. 401-52.000.

Kharchenko, Vladimir P.: *See*—
Gudov, Vasily F.; Yakhontov, Nikolai E.; Kharchenko, Vladimir P.; Dolotov, Boris K.; Belousov, Evgeny L.; Vinitsky, Valery B.; Kozlov, Alexandr M.; Akhalaya, Mikail G.; Koveshinikov, Alexandr D.; and Pugachev, Valery F., 5,067,952, Cl. 606-28.000.

Khoe, Giok D.: *See*—
Bachmann, Peter K.; Khoe, Giok D.; Mahon, Cathal J.; and Lydtin, Hans-Jurgen, 5,067,793, Cl. 385-127.000.

Khouri, Roger K.; and Reddi, A. Harri, to Washington University. Method of making live autogenous skeletal replacement parts. 5,067,963, Cl. 623-16.000.

Ki-Joon, Kim, to SamSung Electronics Co., Ltd. Device for liquid-phase thin film epitaxy. 5,068,516, Cl. 219-388.000.

Kienast, Fritz, to Siemens Aktiengesellschaft. Plug-in component. 5,067,915, Cl. 439-620.000.

Kihara, Naoko: *See*—
Uchida, Ken; Higashi, Michiya; Kihara, Naoko; Shimozawa, Hiroshi; and Yoshizumo, Akira, 5,068,267, Cl. 523-435.000.

Kikuchi, Hideaki; Ogawa, Motosuke; and Niiyama, Akira, to Dupont-Mitsuj Fluorochemicals Co., Ltd.; and Mitsui Petrochemical Industries, Ltd. Cleaning solvent. 5,068,051, Cl. 252-162.000.

Kikuchi, Hideo: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Kikuchi, Hiroshi: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Kikuchi, Juro, to Olympus Optical Co., Ltd. Imaging system for macrophotography. 5,068,679, Cl. 354-271.100.

Kikuchi, Noribumi: *See*—
Nakahara, Kei; Sakurai, Keiichi; Okamura, Toshihiko; Yoshimura, Hironori; Eto, Hiroyuki; and Kikuchi, Noribumi, 5,068,148, Cl. 428-335.000.

Kikuchi, Toshiyuki: *See*—
Kyohzuka, Takahiro; and Kikuchi, Toshiyuki, 5,067,373, Cl. 74-866.000.

Kikuchi, Yutaka: *See*—
Ogata, Yoshinori; Kikuchi, Yutaka; Makino, Tsutomu; Kobayashi, Teruo; and Yoshida, Hirotaka, 5,068,491, Cl. 174-16.200.

Kilb, Hermann: *See*—
Baur, Rupert; Durler, Egon; and Kilb, Hermann, 5,067,832, Cl. 400-66.000.

Kim, John Y. Portable catapult device for hurling a succession of balls for batting practice. 5,067,471, Cl. 124-21.000.

Kim, Kyungtae: *See*—
Kang, Laegu; and Kim, Kyungtae, 5,068,200, Cl. 437-52.000.

Kim, Young-Won: *See*—
Froes, Francis H.; Shong, D. Simon; Kim, Young-Won; and Yolton, Frederick C., 5,067,988, Cl. 148-20.300.

Kimbara, Masahiko: *See*—
Tsuzuki, Makoto; Kimbara, Masahiko; Fukuta, Kenji; and Machii, Akihiko, 5,067,525, Cl. 139-11.000.

Kimbrough, Gregory L.: *See*—
Garver, Lawrence E.; and Kimbrough, Gregory L., 5,067,622, Cl. 215-1.00C.

Kimpton, Gordon L.: *See*—
Dick, Ian R.; Henderson, Ian D.; Kimpton, Gordon L.; and Wyatt, David S., 5,068,507, Cl. 219-73.110.

Kimura, Akio: *See*—
Kiuchi, Naoyuki; Fujimaru, Masanori; Nakagawa, Susumu; Taguchi, Eiji; Kasagi, Masao; Kimura, Akio; and Kawabe, Shinji, 5,067,413, Cl. 104-168.000.

Kimura, Fumio: *See*—
Sugimura, Koichi; Kimura, Fumio; and Izawa, Shigeru, 5,067,812, Cl. 356-237.000.

Kimura, Misao, to Harada Kogyo Kabushiki Kaisha. Clutch device for electrically extensible antennas. 5,068,673, Cl. 343-901.000.

Kimura, Toshiaki: *See*—
Nakahara, Takashi; Kimura, Toshiaki; and Mishima, Takashi, 5,068,256, Cl. 521-150.000.

Kinematic Corporation: *See*—
Carlberg, David L.; Meigs, Theodore V., Jr.; and May, Dennis L., 5,067,309, Cl. 53-520.000.

King, James L.: *See*—
Lykes, Robert E.; and King, James L., 5,068,556, Cl. 310-90.000.

King, James L., Jr.: *See*—
King, James L., Sr.; King, James L., Jr.; and Pope, John, 5,067,590, Cl. 184-15.100.

King, James L., Sr.; King, James L., Jr.; and Pope, John, to Sauk Valley Equipment Company. Method for filling a pressurized lubricant dispensing chamber. 5,067,590, Cl. 184-15.100.

Kinjo, Noriyuki: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Kinoshita, Noboru, to Ishikawajima-Harima Heavy Industries Co., Ltd. Electric power producing system using molten carbonate type fuel cell. 5,068,159, Cl. 429-16.000.

Kintopf, Siegfried: *See*—
Kress, Ulrich; Maul, Rudolf; and Kintopf, Siegfried, 5,068,335, Cl. 546-242.000.

Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, to Sumitomo Rubber Industries, Ltd. Method for correcting type deflection in tire grooving and apparatus therefor. 5,067,539, Cl. 157-13.000.

Kinzel, Walter; and Illgner, Eberhard, to MAN Gutehoffnungshutte AG. Bridge layer. 5,067,191, Cl. 14-2.400.

Kiou, Fu-Tai: *See*—
Spinner, Charles R., III; and Kiou, Fu-Tai, 5,068,201, Cl. 437-60.000.

Kira, Tohru, to Sharp Kabushiki Kaisha. Thin film magnetic head for a bidirectionally moveable recording medium. 5,068,760, Cl. 360-121.000.

Kiriyama, Syunichi: *See*—
Kubo, Eiichi; Kammuri, Yoshihiro; Nagaoka, Koichi; Kitahara, Takeshi; Miyahara, Yoshiki; Kiriyama, Syunichi; and Mishima, Yasunobu, 5,068,141, Cl. 428-219.000.

Kirkland, Michael: *See*—
Hurnik, Frank; Jarmain, Eric; Phillips, Don; Kirkland, Michael; Harkes, Douglas; and Gordon, Donald J., 5,067,443, Cl. 119-71.000.

Kirkpatrick, Thomas I., to United States of America, Navy. Binaural ultrasound detector and imager. 5,068,832, Cl. 367-97.000.

Kishino, Kuniaki; and Nakamura, Tamiya, to Oki Electric Industry Co., Ltd. Method and system for monitoring the number of available buffers. 5,068,784, Cl. 395-275.000.

Kitada, Katsuyoshi, to Mitsuba Electric Manufacturing Co., Ltd. Wiper driving apparatus. 5,068,500, Cl. 200-19.00R.

Kitahara, Takeshi: *See*—
Kubo, Eiichi; Kammuri, Yoshihiro; Nagaoka, Koichi; Kitahara, Takeshi; Miyahara, Yoshiki; Kiriyama, Syunichi; and Mishima, Yasunobu, 5,068,141, Cl. 428-219.000.

Kitajima, Nobuaki; and Takagi, Kazutoshi, to Kabushiki Kaisha Topcon. Microscope. 5,067,804, Cl. 359-369.000.

Kitakami, Osamu; Fujiwara, Hideo; Ojima, Kiyotaka; Ogawa, Youichi; and Wakai, Kunio, to Hitachi Maxell, Ltd. Perpendicular magnetic recording medium and method for producing the same. 5,068,144, Cl. 428-323.000.

Kitakami, Osamu: *See*—
Maro, Tsuyoshi; Kitakami, Osamu; and Fujiwara, Hideo, 5,068,152, Cl. 428-408.000.

Kitamura, Kazumi: *See*—
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Kitamura, Teruo: *See*—
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Kitano, Makoto: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Kiuchi, Naoyuki; Fujimaru, Masanori; Nakagawa, Susumu; Taguchi, Eiji; Kasagi, Masao; Kimura, Akio; and Kawabe, Shinji, to Daifuku Co., Ltd.; and Kanto Jidosha Kogyo Kabushiki Kaisha. Apparatus for conveying travelable body. 5,067,413, Cl. 104-168.000.

Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, to Kawasaki Steel Corporation. Sintered bodies and production process thereof. 5,067,979, Cl. 75-243.000.

Kizaki, Fumihiko: *See*—
Ogawa, Yoshikatsu; Hisada, Haruhiko; Kasahara, Takeshi; Kizaki, Fumihiko; and Yoshiya, Masahide, 5,068,446, Cl. 568-33.000.

Kjornos, Kim: *See*—
Foldager, Jorgen; Toftkjor, Helle; and Kjornos, Kim, 5,068,109, Cl. 424-441.000.

Klaus, Hermann: *See*—
Schmidhammer, Ludwig; Haselwarter, Klaus; Klaus, Hermann; and Mohr, Klaus-Peter, 5,068,475, Cl. 570-262.000.

Klausener, Alexander: *See*—
Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, 5,068,321, Cl. 536-32.000.

Klausner, Judah; and Hotto, Robert, to Klausner Patent Technologies. Location acquisition and time adjusting system. 5,068,838, Cl. 368-47.000.

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Klausner, Judah; and Hotto, Robert, 5,068,838, Cl. 368-47.000.

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Achterrath-Tuckerman, Ute; Aurich, Rudolf; Engel, Jurgen; Hettche, Helmut; and Kleeman, Axel, 5,068,233, Cl. 514-212.000.

Klees, Kevin J., to Eastman Kodak Company. Apparatus for reducing artifacts in error diffused images. 5,068,914, Cl. 382-54.000.

Kleiner, Hans-Jerg: *See*—
Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, 5,068,298, Cl. 526-240.000.

Kleinstauber, Bernd: *See*—
Aschaber, Hans; Bailer, Rudolf; Fochler, Fritz; Kleinstauber, Bernd; and Ruf, Reinhold, 5,067,937, Cl. 493-310.000.

Klemann, Lawrence P.; and Finley, John W., to Nabisco Brands, Inc. Acid-hydrolyzable ester derivatives as low calorie fat mimetics. 5,068,119, Cl. 426-601.000.

Klemann, Lawrence P.: *See*—
Yarger, Ronald G.; Klemann, Lawrence P.; and Finley, John W., 5,068,120, Cl. 426-611.000.

Kleyer, Don L.; and Speier, John L., to Dow Corning Corporation. Production of organofunctional alkoxysilanes. 5,068,387, Cl. 556-485.000.

Kline, Todd A.; Rosen, Warren A.; Bermingham, William J.; and Alfonsi, Eric A., to United States of America, Navy. Optical interconnects in the computer environment. 5,068,880, Cl. 375-116.000.

Kling, Miguel: *See*—
Miller, Jorge; and Kling, Miguel, 5,068,478, Cl. 585-324.000.

Klingler, Otto; Gruhler, Siegfried; and Rivinius, Helmut, to Mauser-Werke Oberndorf GmbH. Capacitive displacement measuring device with T-shaped scale coatings. 5,068,653, Cl. 340-870.370.

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Finsterwalder, Gerhard; Rizk, Reda; and Michels, Hans G., 5,067,880, Cl. 417-495.000.

Kloimstein, Engelbert: *See*—
Sajtos, Alexander; Kloimstein, Engelbert; Hollinger, Karl; and Farnlettner, Lorenz, 5,068,417, Cl. 562-577.000.

Klopfleisch, Kim A.; Wellman, Tim A.; Kaiser, Willard D.; Koenig, Mark J.; Ridgway, Richard W.; Walters, Bobby L.; and Zelinski, Matthew S., to Crown Equipment Corporation. Distance and angle measurements in a wire guided vehicle. 5,068,791, Cl. 364-424.020.

Klotz, Helmut: *See*—
Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, 5,068,015, Cl. 204-89.000.

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KMS Fusion, Inc.: *See*—
O'Holleran, Thomas P., 5,068,071, Cl. 264-56.000.

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Engle, Thomas H., 5,067,872, Cl. 414-786.000.

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Carlson, Elmer V., 5,068,901, Cl. 381-68.600.

Knox, George J.; Cronch, Daniel F.; and Afflerbaugh, Martin G., to Minnesota Mining and Manufacturing Company. Solderless electrical connector. 5,067,910, Cl. 439-402.000.

Knox, J. Paul; Murray, Robert B., III; and Smith, Clinton L., to Golf Vegas International, Inc. Rolling ball speed and position indicating device and method. 5,067,718, Cl. 273-185.00R.

Knudson, Mark R.: *See*—
Hackett, James I.; Dellert, David W.; and Knudson, Mark R., 5,068,905, Cl. 382-47.000.

Knuth, Mark E.; and Sahai, Om P., to Escagenetics, Inc. Flavor composition and method. 5,068,184, Cl. 435-41.000.

Knutti, David F.: *See*—
Jacobsen, Stephen C.; Iversen, Edwin K.; Knutti, David F.; and Davis, Clark C., 5,067,512, Cl. 137-83.000.

Koa, Chi H., to Michigan Seat Company. Foam seat with insert. 5,067,772, Cl. 297-452.000.

Koa, Chi H., to Michigan Seat Company. Foam seat cushion with clamped edges. 5,067,773, Cl. 297-457.000.

Kobayashi, Atsushi: *See*—
Abe, Nobumasa; Kobayashi, Atsushi; Watanabe, Koji; Morishita, Norio; and Tanaka, Yuji, 5,068,684, Cl. 355-27.000.

Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, to Hitachi, Ltd.; and Hitachi Babcock Kabushiki-kaisha. Low NOx boiler. 5,067,419, Cl. 110-234.000.

Kobayashi, Hiroshi; and Shimizu, Masaaki, to SDS Biotech K.K. Trifluorobenzene compounds and process for producing the same. 5,068,411, Cl. 562-484.000.

Kobayashi, Hisamine; and Shimizu, Toshiharu, to Tipton Manufacturing Corporation. Apparatus for removing burrs from workpieces. 5,067,860, Cl. 409-185.000.

Kobayashi, Katsumi, to Mitsubishi Monsanto Chemical Company. Process for surface treatment of N-alkyl-N'phenyl-p-phenylenediamine. 5,068,438, Cl. 564-434.000.

Kobayashi, Keiichi: *See*—
Murakami, Katsuhiko; Yamagami, Nobuo; Nakanishi, Toshiyuki; Nakano, Iwao; Kobayashi, Keiichi; and Yokhikawa, Takashi, 5,067,551, Cl. 164-122.200.

Kobayashi, Kenshi: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Semi-submerged water vehicle. 5,067,427, Cl. 114-56.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Reverse thruster for water jet propulsion. 5,067,918, Cl. 440-39.000.

Kobayashi, Syoji, to Koito Manufacturing Co., Ltd. Variable light distribution type automobile lamp. 5,068,768, Cl. 362-61.000.

Kobayashi, Takaichi, to Kabushiki Kaisha Toshiba. Personal computer having condition indicator. 5,068,652, Cl. 340-815.030.

Kobayashi, Teruo: *See*—
Ogata, Yoshinori; Kikuchi, Yutaka; Makino, Tsutomu; Kobayashi, Teruo; and Yoshida, Hirotaka, 5,068,491, Cl. 174-16.200.

Kobayashi, Yoshiteru: *See*—
Okamura, Yoshio; Takarada, Mitsuhiro; Kobayashi, Yoshiteru; and Takahashi, Tadashi, 5,068,301, Cl. 528-15.000.

Kobayashi, Yuji: *See*—
Maekawa, Shigeki; Yamashita, Mikio; Kawaguchi, Kenji; and Kobayashi, Yuji, 5,067,550, Cl. 164-120.000.

Kobinger, Walter: *See*—
Grell, Wolfgang; Hurnaus, Rudolf; Reiffen, Manfred; Sauter, Robert; Pichler, Ludwig; Kobinger, Walter; Entzeroth, Michael; Mierau, Joachim; and Schingnitz, Gunter, 5,068,325, Cl. 514-215.000.

Koda, Fumio: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Koda, Yoshiharu; and Takashima, Tadashi, to Kabushiki Kaisha Denkosha. Lighting device for fluorescent discharge tube. 5,068,574, Cl. 315-225.000.

Koelsch, Lester M. Swimming pool cover. 5,067,182, Cl. 4-498.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Marx, Helmut H., 5,067,402, Cl. 101-226.000.

Koenig, Mark J.: *See*—
Klopfleisch, Kim A.; Wellman, Tim A.; Kaiser, Willard D.; Koenig, Mark J.; Ridgway, Richard W.; Walters, Bobby L.; and Zelinski, Matthew S., 5,068,791, Cl. 364-424.020.

Koert, Peter; and Cha, James T., to APTI, Inc. Power beaming system. 5,068,669, Cl. 343-700.0MS.

Koglin, Dennis M.: *See*—
Kearney, Mark B.; Koglin, Dennis M.; and Michael, Jeffrey A., 5,068,595, Cl. 323-316.000.

Koh-I-Noor Inc.: *See*—
Felgentreu, Peter, 5,067,839, Cl. 401-258.000.

Kohler, Burkhard: *See*—
Dorf, Ernst-Ulrich; Russeler, Wolfgang; Kohler, Burkhard; Ebert, Wolfgang; and Schmitt, Walter, 5,068,312, Cl. 528-388.000.

Kohler, Frederick H. Toilet bowl protector. 5,067,185, Cl. 4-661.000.

Kohler, Gernot. Use of a metal chelate of an alkylaminoester of phosphoric acid for prophytlaxis or therapy of a neuropathy. 5,068,228, Cl. 514-114.000.

Kohnke, Ole B., to Ambu International A/S. Apparatus for respiratory training. 5,067,707, Cl. 272-99.000.

Koike, Hiroyuki: *See*—
Nakamura, Norio; Koike, Hiroyuki; and Oshima, Takeshi, 5,068,340, Cl. 548-119.000.

Koike, Hitoshi: *See*—
Iwabe, Kazuki; Kubo, Naoki; Tamayama, Hiroshi; Yano, Takashi; Soga, Takashi; and Koike, Hitoshi, 5,068,718, Cl. 358-27.000.

Koike, Shoji; and Tomida, Yasuko, to Canon Kabushiki Kaisha. Recording process and liquid using water-soluble organic solvent. 5,067,980, Cl. 106-22.000.

Koito Manufacturing Co., Ltd.: *See*—
Kobayashi, Syoji, 5,068,768, Cl. 362-61.000.
Oda, Goichi; Shidoh, Masaya; Toda, Atsushi; Ozaki, Akiyoshi; Matsumoto, Akihiro; Yagi, Soichi; and Murata, Atsuhiko, 5,068,570, Cl. 315-128.000.

Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, to Toyo Seikan Kaisha Ltd. Emulsion water paint and process for its production using phase inversion of epoxy-acrylic curing agent resin composition. 5,068,266, Cl. 523-336.000.

Kokaku, Hiroyoshi: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Kokubo, Kouichi; Tagawa, Shinichi; Kawanishi, Masaki; Sato, Kunihito; Buma, Shuuichi; Yonekawa, Takashi; and Aburaya, Toshio, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Pressure control system for suspension. 5,067,743, Cl. 280-707.000.

Kokubo, Tadashi; Yamamuro, Takao; and Abe, Yoshio, to Kyoto University. Process for forming a bioactive hydroxyapatite film. 5,068,122, Cl. 427-2.000.

Kolesar, Edward S., Jr.: *See*—
Carver, Michael W.; and Kolesar, Edward S., Jr., 5,067,985, Cl. 136-255.000.

Koller, Frank H., to Emerson Electric Co. Precision overload clutch apparatus for automated machinery. 5,067,600, Cl. 192-56.00R.

Komae, Hitoshi: *See*—
Tanaka, Hiroshi; Ishiwata, Tetsuo; Hitotsumachi, Shuzo; Komae, Hitoshi; Yamaguchi, Susumu; Yoshino, Tadashi; and Yamauchi, Eiji, 5,068,752, Cl. 360-32.000.

Komerek, Karl R., deceased: *See*—
Davidson, Joseph W.; Blackmore, Geoffrey; Blackmore, Gerald; Komerek, Karl R., deceased; and Komerek, Richard, executor, 5,067,968, Cl. 44-550.000.

Komerek, Richard, executor: *See*—
Davidson, Joseph W.; Blackmore, Geoffrey; Blackmore, Gerald; Komerek, Karl R., deceased; and Komerek, Richard, executor, 5,067,968, Cl. 44-550.000.

Kondo, Hidetaka: *See*—
Umeda, Toru; Kondo, Hidetaka; and Kato, Kouichi, 5,068,769, Cl. 362-61.000.

Kondo, Hideyuki: *See*—
Hagino, Sadaaki; Suzuki, Motokazu; Kondo, Hideyuki; Nishikawa, Shigeru; and Hayashi, Kenichi, 5,068,219, Cl. 505-1.000.

Kondo, Michio, to Brother Kogyo Kabushiki Kaisha. Surface roughness measuring method and apparatus utilizing truncated conical lens and objective lens. 5,068,541, Cl. 250-571.000.

Kondo, Tetsujiro; and Takahashi, Kenji, to Sony Corporation. Coding apparatus that temporally interpolates block data and selects transmission mode. 5,068,726, Cl. 358-135.000.

Kondo, Toshiro; and Miura, Hidetoshi, to Mitsubishi Paper Mills, Limited. Developer with hydroxyaryl fatty acid for making lithographic printing plate. 5,068,164, Cl. 430-204.000.

Kone Oy: *See*—
Hilber, Walter, 5,067,871, Cl. 414-786.000.

Konica Corporation: *See*—
Kosugi, Hiromitsu; Otani, Shinichi; Kashino, Teruo; Andoh, Masakazu; Arai, Takeo; and Nagashima, Toshiharu, 5,068,681, Cl. 354-299.000.
Sasa, Nobumasa; Shimizu, Kunio; and Watanabe, Manabu, 5,068,689, Cl. 355-107.000.
Yagi, Katsuya, 5,068,845, Cl. 369-112.000.

Konica Corporations: *See*—
Soma, Utami; Koseki, Yasufumi; and Asakawa, Minoru, 5,068,853, Cl. 371-16.300.

Konrad, Andreas: *See*—
Roder, Manfred; and Konrad, Andreas, 5,067,599, Cl. 192-0.320.

Kopf, Rose F.: *See*—
Deppe, Dennis G.; Feldman, Leonard C.; Kopf, Rose F.; Schubert, Erdmann F.; Tu, Li Wei; and Zydzik, George J., 5,068,868, Cl. 372-45.000.

Koppenhoffer, Gerhard: *See*—
Schossig, Juergen; Koppenhoffer, Gerhard; Irgang, Matthias; Schnur, Rudi; and Roley, George, 5,068,468, Cl. 568-861.000.

Korbonski, John A., to Systems Division Incorporated. Method for drilling small holes in printed circuit boards. 5,067,859, Cl. 408-1.00R.

Korn, Marcel. Orthodontic appliance. 5,067,896, Cl. 433-6.000.

Korthoff, Herbert W., to United States Surgical Corporation. Surgical needle-suture attachement for controlled suture release. 5,067,959, Cl. 606-224.000.

Kosaka, Tokihiro, to Toa Medical Electronics Co., Ltd. Processor for extracting and memorizing cell images. 5,068,906, Cl. 382-48.000.

Koscica, Thomas E.: *See*—
Babbitt, Richard W.; Rachlin, Adam; and Koscica, Thomas E., 5,068,627, Cl. 331-99.000.

Koseki, Yasufumi: *See*—
Soma, Utami; Koseki, Yasufumi; and Asakawa, Minoru, 5,068,853, Cl. 371-16.300.

Kosem, Marion; Cachat, Anthony J.; and Toth, Thomas D., to Reliance Electric Industrial Company. Industrial control system device. 5,068,778, Cl. 364-138.000.

Kosmyna, Michael J., to Ransburg Corporation. Pressure feed paint cup valve. 5,067,518, Cl. 137-588.000.

Kosugi, Hiromitsu; Otani, Shinichi; Kashino, Teruo; Andoh, Masakazu; Arai, Takeo; and Nagashima, Toshiharu, to Konica Corporation. Drying air control method in an automatic developing machine and an automatic developing machine employing the method. 5,068,681, Cl. 354-299.000.

Koszalka, George W.; Burns, Charlene L.; Krenitsky, Thomas A.; and Rideout, Janet L., to Burroughs Wellcome Co. 2-amino-6-(cyclopropylamino)purine-9-β-D-2',3'-dideoxyribofuranoside and its pharmaceutically acceptable salts. 5,068,320, Cl. 536-24.000.

Koth, Lawrence J.: *See*—
Hellenguard, Hanh P.; Koth, Lawrence J.; and Vaughan, Donald T., 5,068,796, Cl. 364-469.000.

Kotrotsios, Georges; and Parriaux, Olivier, to Centre Suisse d'Electronique et de Microtechnique S.A. Optical sensor with intermodal interferometry. 5,067,815, Cl. 356-345.000.

Kotzch, Hans-Joachim: *See*—
Rauleder, Hartwig; and Kotzch, Hans-Joachim, 5,068,382, Cl. 556-495.000.

Koura, Seigo: *See*—
Tokunaga, Takumi; Watanabe, Hiroyuki; Tsuzuki, Kenji; Someya, Sinzo; Koura, Seigo; and Ito, Mikio, 5,068,365, Cl. 549-496.000.

Kouzai, Takao: *See*—
Naito, Susumu; Kouzai, Takao; and Ikeda, Ritoko, 5,068,399, Cl. 560-212.000.

Kovacs, Adam. Antitumor pharmaceutical compositions and process for preparing the same. 5,068,240, Cl. 514-401.000.

Kovacs, Joseph; Masur, Henry; and Allegra, Carmen, to United States of America, Health and Human Services. Treatment of a microbial infection with drugs containing para-acetamidobenzoic acid. 5,068,253, Cl. 514-553.000.

Kovalcin, David: *See*—
Bruckert, William; Kovalcin, David; Bissett, Thomas D.; Munzer, John; Mazur, Dennis; Mott, Peter R., Jr.; Dearth, Glenn A.; Alonso, Carlos; and Katan, Ann, 5,068,780, Cl. 395-700.000.
Bruckert, William; Bissett, Thomas D.; Kovalcin, David; and Nene, Ravi, 5,068,851, Cl. 371-16.100.

Koveshinikov, Alexandr D.: *See*—
Gudov, Vasily F.; Yakhontov, Nikolai E.; Kharchenko, Vladimir P.; Dolotov, Boris K.; Belousov, Evgeny L.; Vinitsky, Valery B.; Kozlov, Alexandr M.; Akhalaya, Mikail G.; Koveshinikov, Alexandr D.; and Pugachev, Valery F., 5,067,952, Cl. 606-28.000.

Kowalski, Joseph W., to B-Line Systems, Inc. Channel nut. 5,067,863, Cl. 411-85.000.

Koyama, Isao: *See—*
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Koyama, Kuniaki, to NEC Corporation. MOS semiconductor device having high-capacity stacked capacitor. 5,068,698, Cl. 357-23.600.

Koyama, Mitsuhiro, to Yamada Iryo Shomei Kabushiki Kaisha. Automatic focus position adjusting unit for use in shadowless lighting device. 5,068,767, Cl. 362-33.000.

Kozawa, Shigeyuki: *See—*
Higuchi, Toshihiko; Nakano, Yasuhiko; Kunii, Nobuaki; Yamaguchi, Yoshiyuki; and Kozawa, Shigeyuki, 5,068,304, Cl. 528-28.000.

Kozlov, Alexandr M.: *See—*
Gudov, Vasily F.; Yakhontov, Nikolai E.; Kharchenko, Vladimir P.; Dolotov, Boris K.; Belousov, Evgeny L.; Vinitsky, Valery B.; Kozlov, Alexandr M.; Akhalaya, Mikail G.; Koveshinikov, Alexandr D.; and Pugachev, Valery F., 5,067,952, Cl. 606-28.000.

Kraft General Foods, Inc.: *See—*
Strandholm, John J., 5,068,118, Cl. 426-582.000.

Kramer, Pieter, to U.S. Philips Corporation. Reflective, optical record carrier. 5,068,846, Cl. 369-275.100.

Krause, Edward A.; Paik, Woo H.; Liu, Vincent; and Essserman, Jim, to General Instrument Corporation. Adaptive motion compensation for digital television. 5,068,724, Cl. 358-133.000.

Krause, Edward A.: *See—*
Katznelson, Ron D.; and Krause, Edward A., 5,068,729, Cl. 358-141.000.

Krause, Helmut: *See—*
Leidecker, Hans-Dieter; Schmidt, Bodo; Krause, Helmut; and Dobener, Karl-Heinz, 5,067,594, Cl. 188-73.350.

Krause, Joachim: *See—*
Reiffenrath, Volker; Poetsch, Eike; Krause, Joachim; and Weber, Georg, 5,068,053, Cl. 252-299.610.
Wachtler, Andreas; Eidenschink, Rudolf; Krause, Joachim; and Kurmeier, Hans-Adolf, 5,068,389, Cl. 558-411.000.

Krebs, Michael A.: *See—*
Chenot, Charles F.; and Krebs, Michael A., 5,068,055, Cl. 252-301.40R.

Kreczmer, Martin A., to Monsanto Company. Process for preparing ether carboxylate builders. 5,068,420, Cl. 562-583.000.

Kreft, Keith A.; Dikopf, Michael; and Loewe, Thomas D., to Sun Electric Corporation. Method and apparatus for generating display waveforms im wasted spark ignition systems. 5,068,613, Cl. 324-379.000.

Kremer, Kenneth A. M.: *See—*
Kuhn, David G.; and Kremer, Kenneth A. M., 5,068,390, Cl. 558-461.000.

Kremer, Paul; and Kerger, Leon, to Ceodeux S.A. Tap for compressed or liquefied gas. 5,067,520, Cl. 137-614.200.

Krenitsky, Thomas A.: *See—*
Koszalka, George W.; Burns, Charlene L.; Krenitsky, Thomas A.; and Rideout, Janet L., 5,068,320, Cl. 536-24.000.

Kress, Ulrich; Maul, Rudolf; and Kintopf, Siegfried, to Ciba-Geigy Corporation. Process for the preparation of 4-hydroxy-2,2,6,6-tetramethylpiperidine. 5,068,335, Cl. 546-242.000.

Kreuder, Hans-Joachim: *See—*
Meixner, Jurgen; Pedain, Josef; Hohlein, Peter; and Kreuder, Hans-Joachim, 5,068,305, Cl. 528-49.000.

Kreutzburg, Franz; and Galleck, Kurt-G., to AEG Olympia Aktiengesellschaft. Method of setting the operating parameters in a microprocessor-controlled typewriter or other microprocessor-controlled office machine. 5,068,824, Cl. 395-800.000.

Krieger, Wolfgang, to Abb Kabel und Draht GmbH. Electrostatic filter cable. 5,068,497, Cl. 174-106.00R.

Krinickas, Alexander: *See—*
Glennon, Timothy F.; Mehl, Byron R.; Thollot, Pierre; and Krinickas, Alexander, 5,068,590, Cl. 322-10.000.

Kroemer, Herbert: *See—*
Sullivan, Gerard J.; Pedrotti, Kenneth D.; and Kroemer, Herbert, 5,067,828, Cl. 385-3.000.

Kroninger, Paul M., Jr.: *See—*
Baxter, Ronald D.; and Kroninger, Paul M., Jr., 5,068,205, Cl. 437-205.000.

Krude, Werner, to GKN Automotive AG. Constant velocity ratio universal joint. 5,067,929, Cl. 464-145.000.

Krug, Thomas: *See—*
Heinz, Jochen; Krug, Thomas; Ruebsam, Klemens; and Kessler, Hans, 5,068,915, Cl. 392-389.000.

Krug, Wolfgang: *See—*
Britz, Lothar; Krug, Wolfgang; and Seferiadis, Johann, 5,068,492, Cl. 174-31.500.

Kuan, Chung A. Structure of motorcycle stand. 5,067,739, Cl. 280-304.000.

Kubert, Daniel A.: *See—*
Fawzi, Mahdi B.; Kubert, Daniel A.; and Murthy, Kuchi S., 5,068,110, Cl. 424-461.000.

Kubo, Eiichi; Kammuri, Yoshihiro; Nagaoka, Koichi; Kitahara, Takeshi; Miyahara, Yoshiki; Kiriyama, Syunichi; and Mishima, Yasunobu, to Unitika Ltd. Polyolefin-type nonwoven fabric and method of producing the same. 5,068,141, Cl. 428-219.000.

Kubo, Kazuhiro: *See—*
Suzuki, Fumio; Shimada, Junichi; Kubo, Kazuhiro; Ohno, Tetsuji; Karasawa, Akira; Ishii, Akio; and Nonaka, Hiromi, 5,068,236, Cl. 514-263.000.

Kubo, Naoki: *See—*
Iwabe, Kazuki; Kubo, Naoki; Tamayama, Hiroshi; Yano, Takashi; Soga, Takashi; and Koike, Hitoshi, 5,068,718, Cl. 358-27.000.

Kubo, Yoshihiro: *See—*
Suzuki, Riichiro; Akiyama, Shigeyuki; and Kubo, Yoshihiro, 5,067,814, Cl. 356-339.000.

Kubota, Hitoshi; Yamane, Manabu; and Anezaki, Takashi, to Matsushita Electric Industrial Co., Ltd. Apparatus for mounting a flat package type IC. 5,068,588, Cl. 318-640.000.

Kuchiki, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Numerical control device. 5,068,585, Cl. 318-569.000.

Kuethe, David F., to Oscar Mayer Foods Corporation. Packaging with utensil. 5,067,304, Cl. 53-410.000.

Kuhn, David G.; and Kremer, Kenneth A. M., to American Cyanamid Company. 1,1,1-trifluoro-2-propene compounds. 5,068,390, Cl. 558-461.000.

Kuhnle, William G.: *See—*
Murnane, James F., III; and Kuhnle, William G., 5,067,410, Cl. 102-489.000.

Kukimoto, Hiroshi; Mitsuishi, Iwao; and Yasuda, Takashi, to Misawa Co. Ltd. Method of manufacturing a light emitting element. 5,068,204, Cl. 437-127.000.

Kulkarni, Milind V., to Honeywell Inc. Reserve activated electrochemical cell. 5,068,162, Cl. 429-116.000.

Kull, Hermann: *See—*
Joachim, Ernst-Ulrich; and Kull, Hermann, 5,067,461, Cl. 123-357.000.

Kulprathipanja, Santi; and Oroskar, Anil R., to UOP. Separation of lactic acid from fermentation broth with an anionic polymeric absorbent. 5,068,418, Cl. 562-580.000.

Kulprathipanja, Santi; and Oroskar, Anil R., to UOP. Separation of an organic acid from a fermentation broth with an anionic polymeric adsorbent. 5,068,419, Cl. 562-580.000.

Kumagai, Naoki: *See—*
Nishiura, Akira; Kumagai, Naoki; and Seki, Yasukazu, 5,068,581, Cl. 315-370.000.

Kumai, Seisaku; Yokokoji, Osamu; and Tamaoki, Akihiro, to Asahi Glass Company, Ltd. Fluorinated benzoyl compounds. 5,068,449, Cl. 568-335.000.

Kumar, Virendra: *See—*
D'Ambra, Thomas E.; Bacon, Edward R.; Bell, Malcolm R.; Carabateas, Philip M.; Eissenstat, Michael A.; Kumar, Virendra; Mallamo, John P.; and Ward, Susan J., 5,068,234, Cl. 514-235.200.

Kundis, Dieter: *See—*
McAlpine, Warren W.; and Kundis, Dieter, 5,067,830, Cl. 385-114.000.

Kung, Hank F. Dopamine receptor ligands and imaging agents. 5,068,326, Cl. 540-594.000.

Kunii, Nobuaki: *See—*
Higuchi, Toshihiko; Nakano, Yasuhiko; Kunii, Nobuaki; Yamaguchi, Yoshiyuki; and Kozawa, Shigeyuki, 5,068,304, Cl. 528-28.000.

Kunimi, Yuji; Tabata, Akihiko; and Fujita, Yatsuka, to K.K. Ueno Seiyaku Oyo Kenkyujo. Process for production of solid sorbitol. 5,068,467, Cl. 568-852.000.

Kunz, Peter: *See—*
Hunziker, Bruno; and Kunz, Peter, 5,067,691, Cl. 251-315.000.

Kunz, Walter: *See—*
Huxley, Alica; Kunz, Walter; Ackermann, Peter; and Sutter, Marius, 5,068,359, Cl. 549-58.000.

Kuo, Ching-Chuan: *See—*
Fann, Yaw-Shin; Chiou, Ming-Shyang; and Kuo, Ching-Chuan, 5,067,758, Cl. 292-347.000.

Kurachi, Yoshio: *See—*
Shinkai, Kunio; Suzuki, Toyoo; Nomura, Yukitaka; Kurachi, Yoshio; and Kureishi, Hiroyuki, 5,067,204, Cl. 19-159.00A.

Kuraray Co., Ltd.: *See—*
Negi, Taichi; Hirofuji, Satoshi; Tanaka, Nobuo; and Kawai, Syuji, 5,068,077, Cl. 264-512.000.

Kurashima, Yasumi, to NEC Corporation. Constant voltage power supply for a plurality of constant-current sources. 5,068,594, Cl. 323-314.000.

Kuratani, Junichi, to Alps Electric Co., Ltd. Control lever type input device. 5,068,499, Cl. 200-6.00A.

Kureha Kagaku Kogyo K.K.: *See—*
Akatsu, Masahiro; Takayama, Hajime; and Matsuoka, Takeshi, 5,068,481, Cl. 585-426.000.
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Kureishi, Hiroyuki: *See—*
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Kurihara, Kazushige: *See—*
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Kurita Water Industries, Ltd.: *See—*
Ogawa, Zensuke, 5,068,183, Cl. 435-22.000.

Kurita, Yoshio; and Akamatsu, Akira, to Rohm Co., Ltd. Method of manufacturing semiconductor devices, and leadframe and differential overlapping apparatus therefor. 5,068,206, Cl. 437-220.000.

Kuriyama, Katsumi: *See—*
Misaizu, Iwao; Hanada, Kazuyuki; Shibuya, Akihiko; and Kuriyama, Katsumi, 5,068,295, Cl. 526-245.000.
Kurmeier, Hans-Adolf: *See—*
Wachtler, Andreas; Eidenschink, Rudolf; Krause, Joachim; and Kurmeier, Hans-Adolf, 5,068,389, Cl. 558-411.000.
Kuroda, Yasuhiro; and Suzuki, Hideo, to Nitto Denko Corporation. Dam rubber for car window and adhered window structure. 5,067,290, Cl. 52-208.000.
Kuroda, Yasuo: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 5,068,376, Cl. 556-137.000.
Kurokawa, Akemi: *See—*
Ando, Minato; Kato, Takashi; Aoki, Hideyasu; Mizushima, Yasuyuki; Okura, Tsunetoshi; and Kurokawa, Akemi, 5,068,542, Cl. 250-573.000.
Kurokawa, Masashi: *See—*
Okumura, Hiroyuki; Kurokawa, Masashi; Namikawa, Akira; and Tanisake, Hiroka, 5,068,281, Cl. 524-753.000.
Kurokawa, Toshiko: *See—*
Horiuchi, Tatsuo; and Kurokawa, Toshiko, 5,068,190, Cl. 435-190.000.
Kusanagi, Hiroaki, to Toshiba Kikai Kabushiki Kaisha. Moistening water supply apparatus for printing press. 5,067,401, Cl. 101-148.000.
Kushi, Naoto; Takaoka, Toshio; and Muramatsu, Motoyasu, to Toyota Jidosha Kabushiki Kaisha. Slip control system for a vehicle provided with an internal combustion engine. 5,067,579, Cl. 180-197.000.
Kuwahara, Masahiro: *See—*
Tanaka, Masahide; Agou, Tokinori; Kuwahara, Masahiro; Sakashita, Takeshi; Shimoda, Tomoaki; and Sudou, Masaru, 5,068,400, Cl. 560-223.000.
Kuwahara, Yasumasa; and Leal, Walter S., to Daikin Industries, Ltd. Novel monoterpenes. 5,068,453, Cl. 568-494.000.
Kwalu (Proprietary) Limited: *See—*
Ponting, Robert F. B., 5,067,842, Cl. 403-265.000.
Kwasman, Alan, to Kwasman, Alan. Quick screening for scotopic sensitivity syndrome. 5,067,806, Cl. 351-233.000.
Kyohzuka, Takahiro; and Kikuchi, Toshiyuki, to Mazda Motor Corporation. Automatic-transmission control system. 5,067,373, Cl. 74-866.000.
Kyoto University: *See—*
Kokubo, Tadashi; Yamamuro, Takao; and Abe, Yoshio, 5,068,122, Cl. 427-2.000.
Kyowa Electronic Instruments Co., Ltd.: *See—*
Kawai, Masayasu, 5,067,354, Cl. 73-862.340.
Kyowa Hakko Kogyo Co., Ltd.: *See—*
Kanda, Yutaka; Kasai, Masaji; Arai, Hitoshi; Morimoto, Makoto; and Ashizawa, Tadashi, 5,068,349, Cl. 548-418.000.
Suzuki, Fumio; Shimada, Junichi; Kubo, Kazuhiro; Ohno, Tetsuji; Karasawa, Akira; Ishii, Akio; and Nonaka, Hiromi, 5,068,236, Cl. 514-263.000.
Kyrtsos, Christos T.; and Worrell, Dean A., to Caterpillar Inc. Dynamic payload monitor. 5,067,572, Cl. 177-139.000.
Kysela, Ernst: *See—*
Beck, Gunter; Kysela, Ernst; and Braden, Rudolf, 5,068,343, Cl. 548-194.000.
L. Schuler GmbH: *See—*
Rahn, Oskar; and Riedisser, Gunter, 5,067,892, Cl. 425-556.000.
Lachenmaier, Sepp. Transmission series. 5,067,361, Cl. 74-325.000.
La Croix, Mark E.: *See—*
Grillo, John M.; Hilby, James A.; La Croix, Mark E.; Polinsky, Mark A.; and Steltzer, Gordon L., 5,067,350, Cl. 73-494.000.
Ladiszlaidesz, Ferenc: *See—*
Brubak, Jens P.; Eftestol, Bard; and Ladiszlaidesz, Ferenc, 5,067,994, Cl. 148-415.000.
Ladwig, Paul K.: *See—*
Brownawell, Darrell W.; Thaler, Warren A.; Bannister, Eric; and Ladwig, Paul K., 5,068,044, Cl. 252-25.000.
Lafay, William P.: *See—*
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Lagasse, Normand L.: *See—*
Waddington, Clive; Lagasse, Normand L.; and Taupier, Roger, 5,067,454, Cl. 123-196.00S.
Laine, Jaakko E: *See—*
Jokinen, Olli; Kettunen, Jukka; Lepo, Jarkko; Niemi, Tapio; and Laine, Jaakko E, 5,068,009, Cl. 162-9.000.
Lalesse, Herman C., to U.S. Philips Corporation. Method of separating a component from a row of components and apparatus for carrying out the method. 5,067,873, Cl. 414-789.900.
Lampert, Norman R., to AT&T Bell Laboratories. Optical fiber connector buildout system. 5,067,783, Cl. 385-60.000.
Lamprecht, Antonio R.: *See—*
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.
Land, Larry D. Method and apparatus for obtaining and recording fingerprint indicia. 5,067,749, Cl. 283-117.000.
Lang, Gerard: *See—*
Maignan, Jean; Malle, Gerard; and Lang, Gerard, 5,068,393, Cl. 560-51.000.
Lang, John; and Garvey, Cormac. Apparatus for filling self-sealing tubes. 5,067,532, Cl. 141-329.000.
Lang, Mark G.: *See—*
Go, Winston S.; Roti, Joseph S.; Lang, Mark G.; and Weiss, Charles O., 5,068,059, Cl. 252-389.530.
Lange, Barry C.: *See—*
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Langner, Rene J.: *See—*
Heath, Warren J.; Langner, Rene J.; and Bell, Charles A., 5,068,798, Cl. 364-497.000.
Lanser, Michael L.; VanderVeen, Steven E.; and Becker, David J., to Prince Corporation. Visor with extendable panel. 5,067,764, Cl. 296-97.500.
Larac S.p.A.: *See—*
Zavatteri, Ignazio; and Gambini, Tiziana, 5,068,135, Cl. 427-439.000.
Lark, George H.: *See—*
Young, William O., Jr.; and Lark, George H., 5,067,646, Cl. 226-015.000.
Laser Science, Inc.: *See—*
Javan, Ali, 5,068,864, Cl. 372-32.000.
Last, Harry J. Cover drum having tapered ends and automatic swimming pool cover. 5,067,184, Cl. 4-502.000.
Latteur, Alain: *See—*
Heyche, Albert; Latteur, Alain; and Dekoninck, Philippe, 5,067,674, Cl. 244-190.000.
Lau, Chung M.: *See—*
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Lauck, Kenneth L.: *See—*
Hunter, Dave H.; Lauck, Kenneth L.; White, Kevin A.; Milne, Robert J.; Doolin, Leonard J.; and Poulin, Stephen V., 5,067,875, Cl. 416-114.000.
Lauderdale, Harold L., to West Point Pepperell, Inc. Method of making a reinforcing fabric for power transmission belts, hoses and the like. 5,068,000, Cl. 156-148.000.
Lauer, Peter, to Alfred Teves GmbH. Adjusting mechanism for a control member. 5,067,365, Cl. 74-501.50R.
Laughlin, Darren R., to Applied Technology Associates, Inc. Magneto-hydrodynamic angular rate sensor for measuring large angular rates. 5,067,351, Cl. 73-516.0LM.
Laughner, Michael K., to Dow Chemical Company, The. Molding compositions with acrylonitrile-styrene-acrylate rubber copolymers. 5,068,285, Cl. 525-67.000.
Lavia, Monica. Catheter or cannula position indicator for use in hemodynamic monitoring and the like. 5,068,886, Cl. 378-164.000.
Law, Robert W.: *See—*
Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; Law, Robert W.; and Vincent, Michael T., 5,067,463, Cl. 123-425.000.
Lawless, Rodger L.: *See—*
Pipella, Lawrence S.; Fanjoy, Logan M.; Lawless, Rodger L.; and Davies, James E., 5,068,787, Cl. 364-406.000.
Lawrence, Neil: *See—*
Rolfe, Gary, 5,068,839, Cl. 368-93.000.
Lawrence, Paul J., to Litmus Concepts, Inc. Fecal occult blood test methods. 5,068,197, Cl. 436-66.000.
Lawrence, Richard H., to Digital Equipment Corporation. Single-stage extensible sorter for sorting data and efficiently reading out sorted data, incorporating single-bit devices. 5,068,822, Cl. 395-775.000.
Lawson, Jimmie B.: *See—*
Thigpen, David R.; Lawson, Jimmie B.; and Nelson, Richard C., 5,068,043, Cl. 252-855.400.
Lazzari, Ettore: *See—*
Melloni, Piero; Torre, Arturo D.; Lazzari, Ettore; and Mazzini, Giuseppe, 5,068,433, Cl. 564-349.000.
LCE Partnership: *See—*
O'Lenick, Anthony J., Jr., 5,068,324, Cl. 540-471.000.
Leach, Leonora M. Number-sense card game. 5,067,725, Cl. 273-302.000.
Leake, Bernard W.: *See—*
Strid, Eric W.; and Leake, Bernard W., 5,068,615, Cl. 324-613.000.
Leal, Walter S.: *See—*
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Lebby, Michael S.: *See—*
Jaskie, James E.; Lebby, Michael S.; and Richard, Fred V., 5,067,829, Cl. 385-8.000.
Rogers, Stephen P.; and Lebby, Michael S., 5,068,007, Cl. 156-643.000.
Leblanc, Charles B., to Enspeco Inc. Refrigerant recovery and recharging device. 5,067,327, Cl. 62-292.000.
Lebrun, Jean-Jacques: *See—*
Mignani, Gerard; and Lebrun, Jean-Jacques, 5,068,154, Cl. 428-446.000.
LeClerc, David L.; and Conti, Wayne A., to Chrysler Corporation. Method for determining adherence to a vehicle panel surface. 5,067,997, Cl. 156-64.000.
LeCompte, George W.: *See—*
LoStracco, Gregory; and LeCompte, George W., 5,067,665, Cl. 242-118.320.
Leddon, Warren E.: *See—*
Plester, George; Leddon, Warren E.; and Dalsis, David E., 5,067,616, Cl. 209-3.100.
Lee, Byung C., to Goldstar Co., Ltd. Unitized structure of main bearing and cylinder of rotary compressor. 5,067,884, Cl. 418-63.000.

Lee, Clifford C.; and Welch, M. Bruce, to Phillips Ptroleum Company. Olefin polymerization catalyst and method for production and use. 5,068,212, Cl. 502-105.000.
Lee, Fu-Ming; and Brown, Ronald E., to Phillips Petroleum Company. Separation of monoolefins from paraffins. 5,068,011, Cl. 203-58.000.
Lee, Jae S.: *See—*
Choe, Young K.; Yang, Jeon W.; Lee, Jin H.; Lee, Jae S.; Shim, Kyu H.; and Kang, Jin Y., 5,068,884, Cl. 378-119.000.
Lee, Jin H.: *See—*
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Lee, Kang I., to Monsanto Company. Styrene/maleates terpolymers. 5,068,168, Cl. 430-270.000.
Lee, Kiu H.: *See—*
Edwards, David N.; Jorgensen, Robert J.; Lee, Kiu H.; and Marcinkowsky, Arthur E., 5,068,489, Cl. 585-524.000.
Lee, Raymond H., Jr.: *See—*
Oschansky, Brad; Olschansky, Scott; and Lee, Raymond H., Jr., 5,067,708, Cl. 272-118.000.
Lee, Thomas R.: *See—*
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Lee, Tun-Hou: *See—*
Essex, Myron E.; Allan, Jonathan S.; and Lee, Tun-Hou, 5,068,174, Cl. 435-5.000.
Lee, Woo S. Homopolar rotary machine with flux bypass. 5,068,561, Cl. 310-178.000.
Lee, Yung N.; and Wiggins, Fred R., to Conoco Inc. Activation of water-in-oil emulsions of friction reducing polymers for use in saline fluids. 5,067,508, Cl. 137-13.000.
Leemput, Geert H.; and Leemput, Herman. Apparatus for tapping a fluid through a wall. 5,067,514, Cl. 137-318.000.
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Leemput, Geert H.; and Leemput, Herman, 5,067,514, Cl. 137-318.000.
Leenders, Luc H.: *See—*
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Leeper, Robert L.: *See—*
Hunter, Gary W.; and Leeper, Robert L., 5,067,729, Cl. 273-450.000.
Lehr, Hans-Thomas; and Schafer, Peter, to Dr. Ing.h.c.F. Porsche Aktiengesellschaft. Method and an arrangement for adjusting a height control system of a vehicle. 5,068,792, Cl. 364-424.050.
Lehureau, Jean-Claude: *See—*
Meunier, Paul-Louis; Coutellier, Jean-Marc; and Lehureau, Jean-Claude, 5,067,230, Cl. 29-603.000.
Leidecker, Hans-Dieter; Schmidt, Bodo; Krause, Helmut; and Dobener, Karl-Heinz, to Alfred Teves GmbH. Resilient guide for the brake housing of a floating caliper spot-type disc brake. 5,067,594, Cl. 188-73.350.
Leister, Norman A.: *See—*
Petigara, Ramesh B.; Leister, Norman A.; Pendell, Barry J.; and Woodruff, Robert A., 5,068,344, Cl. 548-213.000.
Leitch, Clifford D., to Motorola, Inc. Spectrally efficient digital FM modulation system. 5,068,874, Cl. 375-51.000.
Leland Stanford Junior University, The Board of Trustees of the: *See—*
Jaffe, Richard A.; and Allison, A. Christopher, 5,067,942, Cl. 604-110.000.
Lemelson, Jerome H. Ball and roller bearings and bearing components. 5,067,826, Cl. 384-492.000.
Lemmens, Joseph R. Variable crank pedal drive for bicycles and the like. 5,067,370, Cl. 74-594.200.
Lemmerz-Werke KGaA: *See—*
Aderer, Peter, 5,067,776, Cl. 301-9.0TV.
Lenke, Gerd M.; and Wiff, Donald R., to GenCorp Inc. In-situ composites. 5,068,292, Cl. 525-509.000.
Lensing, Rudolf. Closure for a container. 5,067,623, Cl. 215-227.000.
Leonard, Didier; and Even, Stephane, to Telemecanique. Detector of the regulated voltage two wire type. 5,068,592, Cl. 323-224.000.
Lepo, Jarkko: *See—*
Jokinen, Olli; Kettunen, Jukka; Lepo, Jarkko; Niemi, Tapio; and Laine, Jaakko E, 5,068,009, Cl. 162-9.000.
Lepoutre, Etienne; Devaux, Michel; Hirschberg, Bruno; Petio, Franz A.; and Weitzer, Paul. Electric arc oven for treating molten metals with a gas and a process therefor. 5,067,693, Cl. 266-44.000.
Le Queau, Marcel: *See—*
Haghiri, Mohammed R.; Guntzburger, Philippe; Fonsalas, Frederic; and Le Queau, Marcel, 5,068,727, Cl. 358-138.000.
Lerou, Jan J.: *See—*
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.
Les Produits Associes LPA-Broxo S.A.: *See—*
Woog, Philippe-Guy E.; and Moret, Michel A., 5,067,480, Cl. 128-32.000.
Leumi, Dov A. Trash receptacle adapted for rotatable mounting having integral locking and supporting means. 5,067,626, Cl. 220-475.000.
Level One Communications, Inc.: *See—*
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Lewis, Jack A.; Lumsden, Douglas; Papavizas, George; Hollenbeck, Martha D.; and Walter, James F., to W. R. Grace & Co.-Conn.; and United States of America, Agriculture. Fungal formulation for biocontrol of soilborne plant pathogens. 5,068,105, Cl. 424-93.000.
Lewis, Kenneth T. Display wall assembly. 5,067,287, Cl. 52-29.000.
Lewis, Richard L. Tomato irrigation and support pole. 5,067,274, Cl. 47-47.000.
Leybold Aktiengesellschaft: *See—*
Heinz, Jochen; Krug, Thomas; Ruebsam, Klemens; and Kessler, Hans, 5,068,915, Cl. 392-389.000.
Sichmann, Eggo; Fritsche, Wolf-Eckart; and Schlussler, Jim, 5,068,021, Cl. 204-192.140.
Li, Alan Y.; Grutsch, James F.; and O'Leary, Kevin P., to Chemical Waste Management, Inc. Activated sludge process with in situ recovery of powdered adsorbent. 5,068,036, Cl. 210-606.000.
Libbey-Owens-Ford Co.: *See—*
Deb, Sugato, 5,067,977, Cl. 65-29.000.
Weaver, William R.; and Matzinger, James E., 5,068,076, Cl. 264-511.000.
Libby, Owen H.: *See—*
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Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., to Life Resonances, Inc. Method and apparatus for controlling the growth of cartilage. 5,067,940, Cl. 600-13.000.
Licht, Elke: *See—*
Degen, Bruno; Feldner, Kurt; Licht, Elke; and Wagner, Gebhard, 5,068,385, Cl. 556-472.000.
Liebermann, Benno E., to Beltec International. Method for cleaning edible oils using an immersible packet containing citrus peels and a packet for cleaning edible oils. 5,068,115, Cl. 426-77.000.
Life Resonances, Inc.: *See—*
Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., 5,067,940, Cl. 600-13.000.
Lifeing, Inc.: *See—*
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Ligh, Jone Y. Pressure balance valve spindle. 5,067,522, Cl. 137-625.330.
Light Work Inc.: *See—*
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Lin, Guu-Trang: *See—*
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Lin, Ivan J. B.; and Jong, S. J., to National Science Council. Production of 3-phenoxy propanal derivatives. 5,068,451, Cl. 568-442.000.
Lin, Jiang-Jen: *See—*
Cuscurida, Michael; McCoy, David R.; and Lin, Jiang-Jen, 5,068,444, Cl. 564-505.000.
Lin, Nan-Horng: *See—*
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Lin, Shaw-Yueh; and Shon, Russell D., to Eastman Kodak Company. Method and apparatus for data interleave with pseudo-randomized resynchronization. 5,068,878, Cl. 375-111.000.
Lin, Tsung-Ping: *See—*
Chuang, Jack; and Lin, Tsung-Ping, 5,067,895, Cl. 431-253.000.
Lind, Stuart J., to Flexmedics Corporation. Flexible guide with safety tip. 5,067,489, Cl. 128-772.000.
Lindert, Andreas; Pierce, John R.; McCormick, David R.; and Zimmermann, William D., to Henkel Corporation. Carbodohydrate-modifed polyphenol compounds and compositions containing them. 5,068,299, Cl. 526-313.000.
Lindley, Daniel D.; Curtis, Thomas A.; Ryan, Timothy R.; de la Garza, Edward M.; Hilton, Charles B.; and Kenesson, Thomas M., to Hoechst Celanese Corporation. Process for the production of 4'-isobutylacetophenone. 5,068,448, Cl. 568-319.000.
Lindskog, Carl G.; Anderson, Rolf; and Loovv, Christer, to AB Tetra Pak. Packaging container opening formation device for a packing machine. 5,068,005, Cl. 156-514.000.
Lindstrom, Erik A.: *See—*
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Liner Kabouki Co., Ltd.: *See—*
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Linkletter, Don R.; and Musil, Joseph E., to Cedarapids, Inc. Method and apparatus for modifying a veil of materials in a drum of a drying apparatus. 5,067,254, Cl. 34-137.000.
Linsinger Maschinenbau GmbH, Firma: *See—*
Pomikacsek, Josef, 5,067,283, Cl. 51-178.000.
Lipner, Melvin H.: *See—*
Impink, Albert J., Jr.; and Lipner, Melvin H., 5,068,080, Cl. 376-215.000.
Lippert, Harry G., to Extrusion Dies, Inc. Replaceable wiping insert for slot die head. 5,067,432, Cl. 118-413.000.
Lippi, Elio: *See—*
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Lipschutz, David, to Hewlett-Packard Company. Dynamic control circuit for multichannel system. 5,068,833, Cl. 367-98.000.
Lipsky, Peter E.; and Thiele, Dwain L., to Board of Regents, University of Texas System. Hydrophobic peptide esters and amides. 5,068,223, Cl. 514-019.000.
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Liska, Frank T.; and Liska, Frank F. Method for making structural products from long, thin, narrow, green wood strands. 5,067,536, Cl. 144-361.000.
Litmus Concepts, Inc.: *See—*
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Livanos, Konstantin, to AT&T Bell Laboratories. Route based network management. 5,068,892, Cl. 379-221.000.

Lloyd, Kurt M.: *See*—
Miskin, Stephen N.; and Lloyd, Kurt M., 5,067,592, Cl. 187-9.00R.

Lloyd, O. H. Perry. Method and apparatus for interfacing of holographic and electronic data. 5,067,792, Cl. 359-32.000.

Locke, Thomas P., to John Fluke Mfg. Co., Inc. Hardware enhancements for improved performance of memory emulation method. 5,068,852, Cl. 371-16.200.

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Wang, Shing C.; Ogura, Mutsuo; Wang, Shyh; and Hsin, Wei, 5,068,869, Cl. 372-45.000.

Lockheed Sanders, Inc.: *See*—
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Loctite (Ireland) Ltd.: *See*—
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Loewe, Thomas D.: *See*—
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Logan Manufacturing Company: *See*—
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Logsdon, James H.; Staller, Steven E.; De Roo, David W.; and Neudeck, Gerold W., to Delco Electronics Corporation; and Purdue Research Foundation. Method for forming thin silicon membrane or beam. 5,068,203, Cl. 437-89.000.

Lohr Industrie, S.A.: *See*—
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Long, David R., to Glaxo Group Limited. Aqueous ranitidine compositions stabilized with ethanol. 5,068,249, Cl. 514-471.000.

Long, Joseph F.: *See*—
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Long, Martin W.: *See*—
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Lonhoff, Norbert: *See*—
Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, 5,068,015, Cl. 204-89.000.

Loovv, Christer: *See*—
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Lord Corporation: *See*—
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Lorenzoni, Loreno; Dessantis, Nino; and Virdis, Angelo, to Enichem Anic S.p.A. Method of purification of the oxalic acid diamide. 5,068,429, Cl. 564-160.000.

LoStracco, Gregory; and LeCompte, George W., to Hughes Aircraft Company. Base layer for an optical fiber wound pack. 5,067,665, Cl. 242-118.320.

Louer, Christopher: *See*—
Smith, W. Novis; and Louer, Christopher, 5,068,368, Cl. 552-556.000.

Lovaas, Olaf K. Telescoping cover for a pickup truck bed. 5,067,766, Cl. 296-100.000.

Love, Andrew M., to Texas Instruments Incorporated. Delay stage with reduced V_{dd} dependence. 5,068,553, Cl. 307-605.000.

Lovrecich, Mara L.; and Riccioni, Giovanna, to Vectorpharma International S.p.A. Pharmaceutical tablets and capsule granulates of sclero-glucan and active substance. 5,068,111, Cl. 424-469.000.

Lown, John M.: *See*—
Maguire, Paul R.; and Lown, John M., 5,067,639, Cl. 222-521.000.

Lowrance, Arlen J. Combined racing kite gate and quick draw device. 5,068,837, Cl. 368-10.000.

LSI Logic Corporation: *See*—
Gascoyne, William H., 5,068,547, Cl. 307-443.000.

LTV Steel Company, Inc.: *See*—
Petrushka, Robert G., 5,067,552, Cl. 164-259.000.

Lucas, Frederick T.: *See*—
Dunsmore, Clay A.; and Lucas, Frederick T., 5,068,575, Cl. 315-241.00P.

Lucas Industries Public Limited Company: *See*—
Pickenhahn, Josef, 5,067,524, Cl. 137-627.500.

Lucas, Lawrence M.: *See*—
Gibney, Michael W.; Lucas, Lawrence M.; and Culver, Roy, Jr., 5,068,116, Cl. 426-23.100.

Lucci, John J.: *See*—
St. Angelo, Stephen, Jr.; Lucci, John J.; Carver, George C.; Heads, Alan; and Mitchell, James F., 5,067,225, Cl. 29-451.000.

Luckower, Herbert: *See*—
Nesser, Thomas A.; Nesser, Deborah L.; Joslyn, Edward P.; Rick, Bernard J.; Luckower, Herbert; and Barczak, John P., 5,067,630, Cl. 221-76.000.

Luetzeler, Robert: *See*—
Auweiler, Willi; Solbach, Bernd; and Luetzeler, Robert, 5,067,250, Cl. 33-783.000.

Lukas, Helmut H.: *See*—
Debortoli, George; and Lukas, Helmut H., 5,067,784, Cl. 385-53.000.

Luker, Edward: *See*—
Julian, Randall K.; and Luker, Edward, 5,067,891, Cl. 425-533.000.

Lumenyte International Corporation: *See*—
Robbins, John A.; Zarian, Jamshid J.; and Willford, Sandford R., 5,067,831, Cl. 385-123.000.

Lumsden, Douglas: *See*—
Lewis, Jack A.; Lumsden, Douglas; Papavizas, George; Hollenbeck, Martha D.; and Walter, James F., 5,068,105, Cl. 424-93.000.

Lundberg, Robert D.: *See*—
Peiffer, Dennis G.; and Lundberg, Robert D., 5,068,278, Cl. 524-547.000.

Lundquist, Lynn. Reduced current starting mechanism for three phase squirrel cage motors. 5,068,560, Cl. 310-125.000.

Lundstrom, Norman H.; and Reed, Russell, Jr., to United States of America, Navy. Plastic bonded explosives which exhibit mild cook-off and bullet impact insensitive properties. 5,067,996, Cl. 149-19.400.

Lunney, James G., to Bausch & Lomb Incorporated. Laser polishing of lens surface. 5,068,514, Cl. 219-121.690.

Lydtin, Hans-Jurgen: *See*—
Bachmann, Peter K.; Khoe, Giok D.; Mahon, Cathal J.; and Lydtin, Hans-Jurgen, 5,067,793, Cl. 385-127.000.

Lyke, Russell V.: *See*—
Jenks, James K.; and Lyke, Russell V., 5,067,521, Cl. 137-625.500.

Lykes, Robert E.; and King, James L., to A. O. Smith Corporation. Bearing bracket for a dynamoelectric machine. 5,068,556, Cl. 310-90.000.

Lyons, John, to Duro Dyne Corporation. Access door for air flow conduits. 5,067,278, Cl. 49-463.000.

Lysenko, Zenon: *See*—
Harris, William J.; Lysenko, Zenon; and Hurtig, Carl W., 5,068,384, Cl. 562-453.000.

M/A-Com Adams-Russell, Inc.: *See*—
Bickford, Wayne F.; and Smith, Kenneth L., 5,067,912, Cl. 439-578.000.

M.E.P. Macchine Elettroniche Piegatrici, SpA: *See*—
Del Fabro, Giorgio, 5,067,337, Cl. 72-161.000.

M-I Drilling Fluids Company: *See*—
Patel, Arvind D.; McGlothlin, Raymond E.; Bleier, Roger D.; and Brinkley, H. N., 5,068,041, Cl. 507-103.000.

Ma, Thomas T., to Ford Motor Company. Fuel timing control. 5,067,459, Cl. 123-295.000.

Maassel, James L.: *See*—
Smith, Morton R.; and Maassel, James L., 5,068,129, Cl. 427-239.000.

MacConnell, William P.: *See*—
Cochran, Mark D.; Shih, Meng-Fu; and MacConnell, William P., 5,068,192, Cl. 435-235.100.

MacGregor, Donald C. Precision press brake. 5,067,340, Cl. 72-389.000.

Machado, Romeu: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

Machida, Tetsuo: *See*—
Miyashita, Koujirou; and Machida, Tetsuo, 5,068,802, Cl. 395-133.000.

Machii, Akihiko: *See*—
Tsuzuki, Makoto; Kimbara, Masahiko; Fukuta, Kenji; and Machii, Akihiko, 5,067,525, Cl. 139-11.000.

Macovski, Albert. Compatible increased aspect ratio television system. 5,068,728, Cl. 358-141.000.

Maddali, Vijay: *See*—
Hoegberg, Lon; and Maddali, Vijay, 5,068,591, Cl. 322-29.000.

Maeda, Takuya, to Alps Electric Co., Ltd. Automatic canceling device for a winker. 5,068,633, Cl. 335-190.000.

Machara, Toshifumi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Center Ltd. Plunger-operated hydraulic pump. 5,067,881, Cl. 417-498.000.

Maekawa, Shigeki; Yamashita, Mikio; Kawaguchi, Kenji; and Kobayashi, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Manufacturing method for defect-free casting product. 5,067,550, Cl. 164-120.000.

Magalotti, Gianfranco, to NEMO S.p.A. Shutter opening device particularly for pleasure craft hatchways. 5,067,277, Cl. 49-386.000.

Mager, Herbert; and Braun, Hans-Jurgen, to Wella Aktiengesellschaft. 2-amino-6-chloro-4-nitro-phenol derivatives, process to their production and hair dyes containing those compounds. 5,067,966, Cl. 8-405.000.

Magill, Joseph: *See*—
Van Geel, Jacobus; Magill, Joseph; Werner, Paul; and Hiernaut, Jean-Pol, 5,068,512, Cl. 219-121.600.

Magnascreen Corporation: *See*—
Brody, Thomas P., 5,068,740, Cl. 358-241.000.

Maguire, Michael, to Scapa, Inc. Spiral shrink belt and a perforated roll. 5,067,217, Cl. 29-121.300.

Maguire, Paul R.; and Lown, John M. Pouring spout which can be selectively opened and closed. 5,067,639, Cl. 222-521.000.

Magyar Tudomanyos Akademia Kozponti Kemiai Kutato Intezete: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 5,068,424, Cl. 562-870.000.

Mahant-Shetti, Shivaling S.; and Harward, Mark G., to Texas Instruments Incorporated. Memory cell circuit and operation thereof. 5,068,825, Cl. 365-154.000.

Mahe, Michel: *See*—
Herent, Gerard; Mahe, Michel; and Romagny, Alex, 5,068,584, Cl. 318-549.000.

Mahon, Cathal J.: *See*—
Bachmann, Peter K.; Khoe, Giok D.; Mahon, Cathal J.; and Lydtin, Hans-Jurgen, 5,067,793, Cl. 385-127.000.

Mahoney, John E., to Xilinx, Inc. Structure and method for producing mask-programmed integrated circuits which are pin compatible substitutes for memory-configured logic arrays. 5,068,603, Cl. 324-158.00R.

Maignan, Jean; Malle, Gerard; and Lang, Gerard, to Societe Anonyme Dite: L'Oreal. Aromatic derivatives of butyric acid, a process for their preparation and their use in cosmetics and in human and veterinary medicine. 5,068,393, Cl. 560-51.000.

Maiville, Randolph L.; and Rogers, Russell L., to Aeroquip Corporation. Dry break coupling. 5,067,752, Cl. 285-119.000.

Majco Building Specialties, L.P.: *See*—
Rhodes, Robert T., Jr., 5,067,476, Cl. 126-540.000.

Makiguchi, Nobuyoshi: *See*—
Mamoru, Takeichi; Naoshi, Hagihara; Hitoshi, Tarukawa; Tawaki, Shinichirou; and Makiguchi, Nobuyoshi, 5,068,187, Cl. 435-106.000.

Makino, Tsutomu: *See*—
Ogata, Yoshinori; Kikuchi, Yutaka; Makino, Tsutomu; Kobayashi, Teruo; and Yoshida, Hirotaka, 5,068,491, Cl. 174-16.200.

Makowka, Bernd: *See*—
Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, 5,068,015, Cl. 204-89.000.

Malamas, Michael S., to American Home Products Corporation. Alkylidene analogs of 1'-aminospiro[isoquinoline-4(1H),3'-pyrrolidine]-1,2',3,5'(2H)-tetrones useful as aldose reductase inhibitors. 5,068,332, Cl. 546-18.000.

Malhotra, Shadi L.; Martins, Maria L.; Stevanovic, Maya D.; and Jones, Arthur Y., to Xerox Corporation. Transparencies. 5,068,140, Cl. 428-216.000.

Mallamo, John P.: *See*—
D'Ambra, Thomas E.; Bacon, Edward R.; Bell, Malcolm R.; Carabateas, Philip M.; Eissenstat, Michael A.; Kumar, Virendra; Mallamo, John P.; and Ward, Susan J., 5,068,234, Cl. 514-235.200.

Malle, Gerard: *See*—
Maignan, Jean; Malle, Gerard; and Lang, Gerard, 5,068,393, Cl. 560-51.000.

Mallory, Chester L.: *See*—
Corle, Timothy R.; Mallory, Chester L.; and Wasserman, Philip D., 5,067,805, Cl. 359-235.000.

Maloney, John G.: *See*—
Shiovitz, Nathan N.; Maloney, John G.; and Steele, Michael F., 5,067,386, Cl. 89-1.808.

Mamoru, Takeichi; Naoshi, Hagihara; Hitoshi, Tarukawa; Tawaki, Shinichirou; and Makiguchi, Nobuyoshi, to Mitsui Toatsu Chemicals, Inc. Process for producing D-α-amino acids. 5,068,187, Cl. 435-106.000.

MAN Gutehoffnungshutte AG: *See*—
Kinzel, Walter; and Illgner, Eberhard, 5,067,191, Cl. 14-2.400.

Man Roland Druckmaschinen AG: *See*—
Massierer, Hartmut, 5,067,403, Cl. 101-248.000.

Mannesmann A.G.: *See*—
Baur, Rupert; Durler, Egon; and Kilb, Hermann, 5,067,832, Cl. 400-66.000.
Gomoll, Guenter; and Hauslaib, Wolfgang, 5,067,833, Cl. 400-213.000.

Mano, Eiichi: *See*—
Nakagawa, Susumu; Ushijima, Ryosuke; Nakano, Fumio; Yamada, Koji; and Mano, Eiichi, 5,068,322, Cl. 540-222.000.

Manocha, Ajit S.; and Yu, Chen-Hua D., to AT&T Bell Laboratories. Method for producing a planar surface in integrated circuit manufacturing. 5,068,207, Cl. 437-231.000.

Manogue, William H.: *See*—
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

Mantz, Ekkehard: *See*—
Behl, Klaus; Erren, Karl-Heinz; and Mantz, Ekkehard, 5,067,215, Cl. 28-190.000.

Manzer, Leo E.: *See*—
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

Maoz, Joseph. Broadband microwave slot antennas, and antenna arrays including same. 5,068,670, Cl. 343-767.000.

Marathon Oil Company: *See*—
Sydansk, Robert D., 5,067,564, Cl. 166-270.000.

Marchione, Joseph H., to Atwood Industries, Inc. Door on-door off vehicle hinge with anti-slap hold-open mechanism. 5,067,201, Cl. 16-270.000.

Marcinkowsky, Arthur E.: *See*—
Edwards, David N.; Jorgensen, Robert J.; Lee, Kiu H.; and Marcinkowsky, Arthur E., 5,068,489, Cl. 585-524.000.

Margolis, Robert M.: *See*—
Kawate, Keith W.; Berthold, James P.; and Margolis, Robert M., 5,068,606, Cl. 324-174.000.

Mark, Frank E.: *See*—
McConchie, Garnet E.; Mark, Frank E.; and Hollmann, Hans-Gunter, 5,068,401, Cl. 560-236.000.

Mark, Joanne R.: *See*—
DiLazzaro, John F.; McAlpin, James L.; and Mark, Joanne R., 5,068,210, Cl. 501-32.000.

Marketmont Pty, Ltd.: *See*—
Trowland, Mark G., 5,067,774, Cl. 298-1.00A.

Marmentini, Enzo; and Marmentini, Joyce. Foldable light weight table. 5,067,417, Cl. 108-36.000.

Marmentini, Joyce: *See*—
Marmentini, Enzo; and Marmentini, Joyce, 5,067,417, Cl. 108-36.000.

Maro, Tsuyoshi; Kitakami, Osamu; and Fujiwara, Hideo, to Hitachi Maxell, Ltd. Magnetic recording medium. 5,068,152, Cl. 428-408.000.

Maron, Stanislav. Removable film boxes for a camera. 5,067,807, Cl. 352-78.00R.

Maroni, Victor A.: *See*—
Iton, Lennox E.; and Maroni, Victor A., 5,068,485, Cl. 585-500.000.

Marquis, Edward T.: *See*—
Sanderson, John R.; and Marquis, Edward T., 5,068,366, Cl. 549-533.000.

Marshall, Keith D.: *See*—
Hafner, V. Walter; and Marshall, Keith D., 5,067,181, Cl. 4-425.000.

Marshall, Marvin. Credit control system for long distance telephone services. 5,068,891, Cl. 379-91.000.

Marshall and Williams Company: *See*—
Hosmer, Christopher E.; and Whaley, John F., 5,067,214, Cl. 26-89.000.

Martenak, Daniel J.: *See*—
Han, Scott; Martenak, Daniel J.; Palermo, Robert E.; and Walsh, Dennis E., 5,068,486, Cl. 585-500.000.

Martignago, Pietro, to Nordica S.p.A. Flexibility adjuster device, particularly for ski boots. 5,067,258, Cl. 36-117.000.

Martinez, Eduardo: *See*—
Valdes, Jacobo; and Martinez, Eduardo, 5,068,803, Cl. 395-150.000.

Martins, Maria L.: *See*—
Malhotra, Shadi L.; Martins, Maria L.; Stevanovic, Maya D.; and Jones, Arthur Y., 5,068,140, Cl. 428-216.000.

Martwick, Wilford E., to Honeywell Inc. Cased telescoped ammunition round. 5,067,407, Cl. 102-434.000.

Martwick, Wilford E., to Honeywell Inc. Cased telescoped ammunition round. 5,067,408, Cl. 102-434.000.

Marubishi Yuka Kogyo Kabushiki Kaisha: *See*—
Ogawa, Yoshikatsu; Hisada, Haruhiko; Kasahara, Takeshi; Kizaki, Fumihiko; and Yoshiya, Masahide, 5,068,446, Cl. 568-33.000.

Maruno, Tohru; Ishibashi, Shigeki; and Nakamura, Kouzaburou, to Nippon Telegraph and Telephone Corporation. Fluorine-containing epoxy (meth) acrylate resin with photoinitiator. 5,068,261, Cl. 522-39.000.

Marx, Dieter; and Kampf, Axel, to Carl-Zeiss-Stiftung. IR-pancratic optical device. 5,067,794, Cl. 359-824.000.

Marx, Helmut H., to Koenig & Bauer Aktiengesellschaft. Apparatus for the prevention of printing machine damage. 5,067,402, Cl. 101-226.000.

Maschinenfabrik Rieter AG: *See*—
Demuth, Robert, 5,067,202, Cl. 19-65.00A.

Masco Corporation: *See*—
Nicklas, James R.; Bright, Gerald; Pullen, Eric V., deceased; and Nicklas, James R., 5,067,513, Cl. 137-98.000.

Mashita, Kentaro: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,068,283, Cl. 525-64.000.

Massachusetts Institute of Technology: *See*—
Van Duyne, Edward, 5,067,460, Cl. 123-337.000.

Massierer, Hartmut, to Man Roland Druckmaschinen AG. Circumferential register adjustment system for a printing machine cylinder. 5,067,403, Cl. 101-248.000.

Mastrolia, Brad: *See*—
McIntyre, Robert G.; and Mastrolia, Brad, 5,067,671, Cl. 244-122.0AH.

Masuda, Katutaro: *See*—
Tanaka, Masakatsu; Itoh, Masanobu; Arabori, Noboru; Nara, Toshihiko; Takahashi, Tastuhiko; Masuda, Katutaro; and Saito, Mitsuo, 5,067,593, Cl. 187-73.000.

Masuda, Masami: *See*—
Hoshi, Satoru; Masuda, Masami; and Kawaguchi, Takayuki, 5,068,831, Cl. 365-203.000.

Masuda, Noboru: *See*—
Yasunaga, Moritoshi; Masuda, Noboru; Todokoro, Hideo; Umemoto, Yasunari; Tanaka, Hirotoshi; and Itoh, Hiroyuki, 5,068,605, Cl. 324-158.00R.

Masuki, Tetsuya: *See*—
Gunji, Akihiko; Masuki, Tetsuya; and Shirai, Hidenori, 5,068,070, Cl. 264-41.000.

Masur, Henry: *See*—
Kovacs, Joseph; Masur, Henry; and Allegra, Carmen, 5,068,253, Cl. 514-553.000.

Masutani, Noboru: *See*—
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Mathias, John R. Treatment of motility disorders with a GnRH analog. 5,068,221, Cl. 514-15.000.

Matsuda, Yusaku, to Sanwa Diamond Industrial Co., Ltd. Cutter and manufacturing method therefor. 5,067,969, Cl. 51-293.000.

Matsugishi, Noriaki: *See*—
Furusawa, Toshihiro; Satoh, Atsushi; Nakajima, Takashi; and Matsugishi, Noriaki, 5,068,068, Cl. 264-23.000.

Matsui, Hiroki: *See*—
Sakai, Ichiro; Arai, Yasuhisa; Yamamoto, Masataka; and Matsui, Hiroki, 5,067,374, Cl. 74-866.000.

Matsui, Keiji: *See*—
Ieki, Atsushi; and Matsui, Keiji, 5,068,530, Cl. 250-237.00G.

Matsumoto, Akihiro: *See*—
Oda, Goichi; Shidoh, Masaya; Toda, Atsushi; Ozaki, Akiyoshi; Matsumoto, Akihiro; Yagi, Soichi; and Murata, Atsuhiko, 5,068,570, Cl. 315-128.000.

Matsumoto, Etsuji; Araki, Mamoru; and Ozaki, Keiichi, to Yazaki Corporation. Electric connection box. 5,067,905, Cl. 439-76.000.

Matsumoto, Hiroshi: *See*—
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,067,447, Cl. 123-3.000.

Matsumoto, Hisashi; and Takami, Masaaki, deceased (by Takami, Harumi, successor), to Mitsubishi Paper Mills, Limited. Process for producing heat-sensitive recording material using roll blade coating. 5,068,133, Cl. 427-358.000.

Matsumoto, Tetsuro: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Matsumoto, Tsunetaka: *See*—
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Matsumoto, Tsuyoshi: *See*—
Ohno, Kou; Hattori, Tetsuo; and Matsumoto, Tsuyoshi, 5,068,529, Cl. 250-231.180.

Matsumura, Shunichi: *See*—
Hara, Shigeyoshi; Inata, Hiroo; and Matsumura, Shunichi, 5,068,307, Cl. 528-125.000.
Inata, Hiroo; Matsumura, Shunichi; Itoh, Seiji; and Okada, Masuhiro, 5,068,062, Cl. 252-518.000.

Matsunaga, Shigeru: *See*—
Ban, Takeshi; Matsunaga, Shigeru; Hirano, Hidemi; Isobe, Tuguo; and Takakura, Yoshio, 5,067,555, Cl. 164-480.000.

Matsuoka, Takeshi: *See*—
Akatsu, Masahiro; Takayama, Hajime; and Matsuoka, Takeshi, 5,068,481, Cl. 585-426.000.
Akatsu, Masahiro; Takayama, Hajime; and Matsuoka, Takeshi, 5,068,482, Cl. 585-429.000.

Matsushima, Eiji; and Takasaki, Hidenori, to Mazda Motor Corporation. Coating apparatus. 5,067,436, Cl. 118-676.000.

Matsushita, Akira: *See*—
Nakano, Shohkichi; and Matsushita, Akira, 5,068,619, Cl. 324-715.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hori, Tohru; Aoki, Masaki; and Fujii, Kenichi, 5,068,147, Cl. 428-336.000.
Ishikawa, Haruo; Kawana, Kiyoshi; Honma, Ko; and Yoshikawa, Takashi, 5,068,537, Cl. 250-342.000.
Kaneaki, Tetsuhiko; Nuriya, Kozo; and Tani, Yasunori, 5,068,661, Cl. 341-143.000.
Kubota, Hitoshi; Yamane, Manabu; and Anezaki, Takashi, 5,068,588, Cl. 318-640.000.
Sugiyama, Shouji; Ohtani, Daisuke; and Tajima, Tadao, 5,068,917, Cl. 455-90.000.
Tanaka, Hiroshi; Ishiwata, Tetsuo; Hitotsumachi, Shuzo; Komae, Hitoshi; Yamaguchi, Susumu; Yoshino, Tadashi; and Yamauchi, Eiji, 5,068,752, Cl. 360-32.000.
Tomii, Kaoru; Miyama, Hiroshi; and Kawauchi, Yoshikazu, 5,068,579, Cl. 315-366.000.
Wada, Masaru; and Itoh, Kunio, 5,068,866, Cl. 372-36.000.

Matsushita, Mitsuyoshi: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; and Yamauchi, Yuji, 5,067,733, Cl. 277-11.000.

Matsuura, Kazuo; Sekino, Hitoshi; Nishiguchi, Keizo; and Yoshida, Narutaka, to Minolta Camera Kabushiki Kaisha. Laser scanner with selected plural beam sources. 5,068,677, Cl. 346-108.000.

Matsuyama, Kazuhiro, to Sharp Kabushiki Kaisha. Photosensitive sheet positioning device. 5,067,664, Cl. 242-67.200.

Matsuzaki, Mikio, to TDK Corporation. Thin film magnetic head of small size capable of certainly and stably connecting lead wires. 5,068,759, Cl. 360-103.000.

Mattersberger, Johann: *See*—
Deeg, Rolf; Wehner, Rainer; Mattersberger, Johann; and Becker, Udo, 5,068,179, Cl. 435-7.920.

Mattes, Bernhard: *See*—
Condne, Claus; Mattes, Bernhard; and Schmalz, Dieter, 5,068,793, Cl. 364-424.050.

Mattes, Donald A.: *See*—
Zlobinsky, Yury; and Mattes, Donald A., 5,067,251, Cl. 34-5.000.

Matthews, Donald H. Device for capturing and restraining animals. 5,067,445, Cl. 119-152.000.

Matthews, Donald P.: *See*—
McCarthy, James R.; Barney, Charlotte L.; and Matthews, Donald P., 5,068,465, Cl. 568-765.000.

Matthews, James A., to MicroUnity Systems Engineering. Hall effect semiconductor memory cell. 5,068,826, Cl. 365-170.000.

Matthews, Joseph B.: *See*—
Kawahara, Masafumi; Bowman, George A.; and Matthews, Joseph B., 5,068,586, Cl. 318-696.000.

Matzinger, James E.: *See*—
Weaver, William R.; and Matzinger, James E., 5,068,076, Cl. 264-511.000.

Mau, Franco E.: *See*—
Chandran, Srikumar R.; Mau, Franco E.; and Jan, Steven A., 5,068,854, Cl. 371-37.100.

Mauer, Josef, to Sulzer-Escher Wyss AG. Method for producing titanium dioxide. 5,068,093, Cl. 423-82.000.

Maul, Rudolf: *See*—
Kress, Ulrich; Maul, Rudolf; and Kintopf, Siegfried, 5,068,335, Cl. 546-242.000.

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Iwase, Yasuyuki, 5,067,838, Cl. 401-206.000.

Mitsui & Co., Ltd.: *See*—
Nakajima, Hiromi, 5,067,553, Cl. 164-412.000.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Nakamura, Yoshinobu; Sannohe, Kanetaro; Sohama, Yoshio; Iwasaki, Toru; and Yamano, Sumiko, 5,068,150, Cl. 428-407.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kikuchi, Hideaki; Ogawa, Motosuke; and Niiyama, Akira, 5,068,051, Cl. 252-162.000.
Nakahara, Takashi; Kimura, Toshiaki; and Mishima, Takashi, 5,068,256, Cl. 521-150.000.
Tanaka, Masahide; Agou, Tokinori; Kuwahara, Masahiro; Sakashita, Takeshi; Shimoda, Tomoaki; and Sudou, Masaru, 5,068,400, Cl. 560-223.000.
Yorozu, Kiyotaka; and Ohno, Hiroyasu, 5,068,455, Cl. 568-567.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Mamoru, Takeichi; Naoshi, Hagihara; Hitoshi, Tarukawa; Tawaki, Shinichirou; and Makiguchi, Nobuyoshi, 5,068,187, Cl. 435-106.000.
Oi, Ryu; Takenaka, Shinji; and Shimakawa, Chitoshi, 5,068,459, Cl. 568-638.000.
Tsumura, Ryuichiro; Muraishi, Teruo; Ideda, Keiichi; and Wang, Jin-Kai, 5,068,357, Cl. 548-548.000.

Mitsuishi, Iwao: *See*—
Kukimoto, Hiroshi; Mitsuishi, Iwao; and Yasuda, Takashi, 5,068,204, Cl. 437-127.000.

Mitutoyo Corporation: *See*—
Ichikawa, Souji, 5,067,816, Cl. 356-373.000.

Miura, Hidetoshi: *See*—
Kondo, Toshiro; and Miura, Hidetoshi, 5,068,164, Cl. 430-204.000.

Miyadera, Hiroshi: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Miyagawa, Hideo: *See*—
Iwamoto, Katsuharu; Kawakami, Osamu; and Miyagawa, Hideo, 5,068,527, Cl. 250-227.210.

Miyagawa, Hitoshi: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Ogino, Masayuki; Miyagawa, Hitoshi; Kamata, Toshio; Watanabe, Mitsuo; and Miyashita, Kunihiro, 5,067,653, Cl. 239-18.000.

Miyahara, Yoshiki: *See*—
Kubo, Eiichi; Kammuri, Yoshihiro; Nagaoka, Koichi: Kitahara, Takeshi; Miyahara, Yoshiki; Kiriyama, Syunichi; and Mishima, Yasunobu, 5,068,141, Cl. 428-219.000.

Miyai, Hiromasa: *See*—
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,068,081, Cl. 376-261.000.

Miyake, Jun: *See*—
Yamaguchi, Yasunori; and Miyake, Jun, 5,068,829, Cl. 365-189.070.

Miyama, Hiroshi: *See*—
Tomii, Kaoru; Miyama, Hiroshi; and Kawauchi, Yoshikazu, 5,068,579, Cl. 315-366.000.

Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Symmetrical dioxazine compounds and their use as fiber-reactive dyes. 5,068,327, Cl. 544-76.000.

Miyaoka, Satoshi, to Kabushiki Kaisha Kobe Seiko Sho. Hydraulic hoisting circuit with electrical control for relief valve adjustment pilot and pilot disable valve. 5,067,321, Cl. 60-426.000.

Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, to Hitachi, Ltd.; Hitachi Microcomputer Engineering, Ltd.; and Akita Electronics Co., Ltd. Semiconductor memory device. 5,068,828, Cl. 365-189.010.

Miyashita, Koujirou; and Machida, Tetsuo, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Graphic drawing method and system with input coordinates automatically adjustable. 5,068,802, Cl. 395-133.000.

Miyashita, Kunihiro: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Ogino, Masayuki; Miyagawa, Hitoshi; Kamata, Toshio; Watanabe, Mitsuo; and Miyashita, Kunihiro, 5,067,653, Cl. 239-18.000.

Miyazaki, Kiyoshi, to Kabushiki Kaisha LPL. Accessory shoe adapter for video camera attached on battery mount portion. 5,068,683, Cl. 354-484.000.

Miyazaki, Kyosuke: *See*—
Nakamura, Takanori; Iwanaga, Sadaaki; Ohno, Motonori; and Miyazaki, Kyosuke, 5,068,314, Cl. 530-317.000.

Mizoguchi, Shoichi, to NEC Corporation. Cross-polarization interference canceller. 5,068,667, Cl. 342-362.000.

Mizuno, Hiroshi: *See*—
Terada, Yasuharu; Ishii, Susumu; and Mizuno, Hiroshi, 5,067,209, Cl. 24-429.000.

Mizushima, Yasuyuki: *See*—
Ando, Minato; Kato, Takashi; Aoki, Hideyasu; Mizushima, Yasuyuki; Okura, Tsunetoshi; and Kurokawa, Akemi, 5,068,542, Cl. 250-573.000.

Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; Suzuki, Tomoko; and Kan, Hirofumi, to Hamamatsu Photonics K.K. Optical full adder. 5,068,815, Cl. 364-713.000.

Mizuta, Akira; and Kitamura, Kazumi, to Fuji Photo Film Co., Ltd. Intermittent feed system. 5,067,607, Cl. 198-733.000.

Mobil Oil Corporation: *See*—
Allen, L. Scott; Mills, William R.; and Stromswold, Daivd C., 5,068,531, Cl. 250-269.000.
Blain, David A.; and Cardis, Angeline B., 5,068,046, Cl. 252-51.50A.
Chen, Catherine S. H.; and Rodewald, Paul G., 5,068,048, Cl. 252-52.00A.
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 5,068,045, Cl. 252-32.007.
Grosz, Edward G.; Herrington, Fox J.; and St. Phillips, Eric A., 5,067,633, Cl. 221-279.000.
Han, Scott; Martenak, Daniel J.; Palermo, Robert E.; and Walsh, Dennis E., 5,068,486, Cl. 585-500.000.
Hen, John, 5,068,042, Cl. 252-8.552.
Herrington, F. John, Jr.; and St. Phillips, Eric A., 5,067,208, Cl. 24-400.000.
Johnson, Ivy D.; and Simmons, Kenneth G., 5,068,216, Cl. 502-241.000.
Valyocsik, Ernest W., 5,068,096, Cl. 423-277.000.
Wu, Margaret M.; and Ho, Suzzy C., 5,068,476, Cl. 585-12.000.

Mochizuki, Masahiro: *See*—
Kano, Junichi; Aoki, Kongoh; Mochizuki, Masahiro; and Nakadozono, Hiroyuki, 5,067,450, Cl. 123-90.170.

Mock, Karl-Heinz: *See*—
Auslander, Klaus; Fabris, Hans-Jurgen; Mock, Karl-Heinz; Patwald, Wolfgang; and Seichter, Helmut, 5,068,612, Cl. 324-327.000.

Moench, Uwe: *See*—
Himmler, Gunther; and Moench, Uwe, 5,067,348, Cl. 73-460.000.

Mogamiya, Makoto; and Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for driving photographing lens and finder device of camera having zoom lens. 5,068,678, Cl. 354-199.000.

Mohn, Frank, to Framo Developments (UK) Limited. Electric motor. 5,068,554, Cl. 310-12.000.

Mohr, Dieter: *See*—
Elsaesser, Andreas; Frass, Werner; and Mohr, Dieter, 5,068,163, Cl. 430-192.000.

Mohr, Kirby S., to Facet Quantek, Inc. Coalescing plate packing system. 5,068,035, Cl. 210-236.000.

Mohr, Klaus-Peter: *See*—
Schmidhammer, Ludwig; Haselwarter, Klaus; Klaus, Hermann; and Mohr, Klaus-Peter, 5,068,475, Cl. 570-262.000.

Molex Incorporated: *See*—
Berry, Stephen R., 5,067,399, Cl. 101-11.000.

Moll, Karl-Andreas, to Minnesota Mining and Manufacturing Company. Method for the application of lengths of a tape to a surface and apparatus. 5,068,004, Cl. 156-494.000.

Molnar, Richard J., to Elsag International B.V. Digital/frequency input for industrial control applications. 5,068,545, Cl. 307-311.000.

Momose, Masanori, to Canon Kabushiki Kaisha. Facsimile apparatus having heat fixation device. 5,068,675, Cl. 346-76.0PH.

Momose, Yoshiaki: *See*—
Yoshida, Yzo; Saitou, Tetuji; and Momose, Yoshiaki, 5,068,136, Cl. 428-35.700.

Monch, Uwe, to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik. Method and apparatus for testing a pneumatic tire. 5,067,347, Cl. 73-146.000.

Moncorge, Jean-Paul, to GEC Alsthom SA. Tension potential measuring circuit with selected time constant. 5,068,598, Cl. 324-107.000.

Monroe, Marvin E., to Quintron, Inc. Ultrasonic glow discharge surface cleaning. 5,068,002, Cl. 156-345.000.

Monsanto Company: *See*—
Fleet, George W. J., 5,068,243, Cl. 514-413.000.
Horng, Liou-Liang, 5,068,421, Cl. 562-583.000.
Kreczmer, Martin A., 5,068,420, Cl. 562-583.000.
Lee, Kang I., 5,068,168, Cl. 430-270.000.
Miller, William H.; and Balthazor, Terry M., 5,068,404, Cl. 502-17.000.
Periana, Roy A.; and Schaefer, George F., 5,068,407, Cl. 562-416.000.

Montalvo, Fredrick N. Gun sight for shooting moving target. 5,067,244, Cl. 33-261.000.

Montanari, Dennis G.; Gentilman, Richard L.; and Tustison, Randal W., to Raytheon Company. Optical elements and method of manufacture. 5,067,781, Cl. 359-350.000.

Moog Inc.: *See*—
Garnjost, Kenneth D., 5,067,684, Cl. 248-550.000.

Mook, William H. Spin communicating ball. 5,067,719, Cl. 273-213.000.

Mooney, John B.; and Sher, Arden, to SRI International. Low dislocation density semiconductor device. 5,068,695, Cl. 357-16.000.

Moore, Archie S., deceased (by Moore, Rosalie I., personal representative); Teske, Robert J.; and Summa, Gareth D., to Mid-West Conveyor Company, Inc. Self-adjusting shock absorbing carrier. 5,067,414, Cl. 104-172.200.

Moore, Daniel E.; and Moore, Dolores. Platform/grill cover unit for use on a land vehicle. 5,067,760, Cl. 293-115.000.

Moore, Dolores: *See*—
Moore, Daniel E.; and Moore, Dolores, 5,067,760, Cl. 293-115.000.

Moore, Duncan T.: *See*—
Haun, Niels; and Moore, Duncan T., 5,068,208, Cl. 501-12.000.

Moore, Eugene L.: *See*—
Dundas, Dennis L.; and Moore, Eugene L., 5,068,075, Cl. 264-505.000.

Moore Industries-International, Inc.: *See*—
Moore, Leonard W., 5,068,850, Cl. 370-85.800.

Moore, Leonard W., to Moore Industries-International, Inc. Parameter value communication system. 5,068,850, Cl. 370-85.800.

Moore, Rosalie I., personal representative: *See*—
Moore, Archie S., deceased; Teske, Robert J.; and Summa, Gareth D., 5,067,414, Cl. 104-172.200.

Moore, Travis: *See*—
Bickely, Alan C.; and Moore, Travis, 5,068,638, Cl. 338-114.000.

Morales, Robert. Bicycle sprocket protector. 5,067,930, Cl. 474-144.000.

Morbioli, Rene J.: *See*—
Fournes, Jean-Paul; and Morbioli, Rene J., 5,068,127, Cl. 427-237.000.

Moreman, Otis S., III, to General Electric Company. Gas turbine bladed disk. 5,067,876, Cl. 416-219.00R.

Moret, Michel A.: *See*—
Woog, Philippe-Guy E.; and Moret, Michel A., 5,067,480, Cl. 128-32.000.

Moretta, Jon C.; and Gombas, Robert D., Jr., to Amoco Corporation. Sludge addition to a coking process. 5,068,024, Cl. 208-13.000.

Mori, Masaji: *See*—
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,068,081, Cl. 376-261.000.

Mori, Nobufumi: *See*—
Muraishi, Katsuaki; Onishi, Masahiro; Mori, Nobufumi; Nunome, Hiromi; and Oikawa, Tetsuo, 5,067,702, Cl. 271-134.000.

Mori, Yoshiaki: *See*—
Ueno, Tsugio; Sato, Masato; and Mori, Yoshiaki, 5,067,231, Cl. 29-809.000.

Moride, Shigeki: *See*—
Shirata, Akihiro; Watanabe, Hideaki; Hagiya, Naoyuki; Ookubo, Satomi; and Moride, Shigeki, 5,067,578, Cl. 180-197.000.

Moriga, Toshinori: *See*—
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,068,266, Cl. 523-336.000.

Morigaki, Masakazu; and Seto, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing a two equivalent 5-pyrazolone magenta coupler and color photograph containing the same. 5,068,171, Cl. 430-9.000.

Morigaki, Masakazu: *See*—
Seto, Nobuo; Morigaki, Masakazu; and Naruse, Hideaki, 5,068,172, Cl. 430-551.000.

Moriguchi, Kouji: *See*—
Sugita, Naomasa; Yotumoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, 5,068,706, Cl. 357-51.000.

Morimoto, Akira; and Iizuka, Takashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for producing a distortion-free two-dimensional image of a scanned object. 5,067,782, Cl. 359-202.000.

Morimoto, Makoto: *See*—
Kanda, Yutaka; Kasai, Masaji; Arai, Hitoshi; Morimoto, Makoto; and Ashizawa, Tadashi, 5,068,349, Cl. 548-418.000.

Morini, Giampiero: *See*—
Albizzati, Enrico; Morini, Giampiero; Giannini, Umberto; Barino, Luisa; Scordamaglia, Raimondo; Barbe, Pier C.; and Noristi, Luciano, 5,068,213, Cl. 502-126.000.

Morisawa, Kunio: *See*—
Kato, Nobuyuki; Habuchi, Ryoji; Morisawa, Kunio; and Itoh, Hiroshi, 5,067,603, Cl. 192-0.076.

Morisawa, Tahei: *See*—
Mogamiya, Makoto; and Morisawa, Tahei, 5,068,678, Cl. 354-199.000.

Morishita, Mimpei; and Azukizawa, Teruo, to Kabushiki Kaisha Toshiba. Transporting system of floated carrier type with zero power control at varying load weights. 5,067,415, Cl. 104-281.000.

Morishita, Mitsuharu, to Mitsubishi Denki Kabushiki Kaisha. Motor-driven type front and rear wheel steering apparatus. 5,067,577, Cl. 180-79.100.

Morishita, Norio: *See*—
Abe, Nobumasa; Kobayashi, Atsushi; Watanabe, Koji; Morishita, Norio; and Tanaka, Yuji, 5,068,684, Cl. 355-27.000.

Morley, Allen D. Device for clamping two metal objects which are to be welded together. 5,067,696, Cl. 269-49.000.

Morong, Thomas: *See*—
Karalis, Anastasios; Morong, Thomas; and Juszkiewicz, Charles, 5,068,431, Cl. 564-301.000.

Morooka, Takashi: *See*—
Kagawa, Takumi; Morooka, Takashi; and Tsuzuki, Kenji, 5,068,336, Cl. 546-302.000.

Morris, Anthony F.; Naef, Regula; Escher, Sina; and Velluz, Alain, to Firmenich SA. Cyclic ethers and their utilization as perfuming or flavoring ingredients. 5,068,362, Cl. 549-346.000.

Morris, Francis J.; Plumton, Donald L.; Yang, Jau-Yuann; and Yuan, Han-Tzong, to Texas Instruments Incorporated. Integrated circuit composed of group III–V compound field effect and bipolar semiconductors. 5,068,756, Cl. 357-16.000.

Morse, Lewis D., to Calgon Corporation. Low free formaldehyde melamine-formaldehyde detackifier and method of using. 5,068,279, Cl. 524-593.000.

Mortreux, Andre : *See*—
Brusson, Jean M.; Bujadoux, Karel; Petit, Francis; Fuchs, Jean M.; and Mortreux, Andre , 5,068,014, Cl. 204-59.00M.

Moser, Franz, to Steyr-Daimler-Puch AG. System for purifying the exhaust gases of diesel engines. 5,067,319, Cl. 60-288.000.

Moslehi, Behzad: *See*—
Jannson, Tomasz P.; Jannson, Joanna L.; and Moslehi, Behzad, 5,067,788, Cl. 385-2.000.

Motion, Keith R.; and Newman, Christopher P., to Unilever Patent Holdings B.V. Cymenol preparation by transfer dehydrogenation. 5,068,466, Cl. 568-781.000.

Motojima, Akira: *See*—
Yamato, Toshitaka; Ito, Tatsuo; Takashima, Atsuyuki; and Motojima, Akira, 5,068,897, Cl. 381-24.000.

Motorola, Inc.: *See*—
Baker, James C.; and Carney, Michael J., 5,068,625, Cl. 331-1.00A.
Dejmek, James W.; and Craig, Ronald A., 5,068,898, Cl. 381-29.000.
Jaskie, James E.; Lebby, Michael S.; and Richard, Fred V., 5,067,829, Cl. 385-8.000.
Leitch, Clifford D., 5,068,874, Cl. 375-51.000.
Rogers, Stephen P.; and Lebby, Michael S., 5,068,007, Cl. 156-643.000.
Williams, Owen P., 5,067,218, Cl. 29-25.010.

Mott, Peter R., Jr.: *See*—
Bruckert, William; Kovalcin, David; Bissett, Thomas D.; Munzer, John; Mazur, Dennis; Mott, Peter R., Jr.; Dearth, Glenn A.; Alonso, Carlos; and Katan, Ann, 5,068,780, Cl. 395-700.000.

Mougne, Marcel L. Method and apparatus for measuring and calculating bulk water in crude oil or bulk water in steam. 5,067,345, Cl. 73-61.10R.

Moulton, Richard J.: *See*—
Clough, Thomas J.; and Moulton, Richard J., 5,068,160, Cl. 429-72.000.

Mounfield, William P., Jr.: *See*—
Guddanti, Suresh; and Mounfield, William P., Jr., 5,068,662, Cl. 341-161.000.

Moura, Anne-Marie; Clemence, Francois; Frechet, Daniel; and Fortin, Michel, to Roussel Uclaf. Benzocyclohexanes and analgesic compositions thereof. 5,068,244, Cl. 514-428.000.

Mouri, Masahide: *See*—
Horinouchi, Kazuo; Mouri, Masahide; and Kameda, Isao, 5,068,072, Cl. 264-66.000.

Movrich, Wayne, to Rich Ideas, Inc. Fabric column kit and system. 5,067,547, Cl. 160-327.000.

MTS Systems Corporation: *See*—
Sullivan, Michael T.; and Tock, Gary S., 5,068,779, Cl. 364-167.010.
Thoen, Bradford K., 5,068,813, Cl. 364-572.000.

Muellenberg, Ralph. Clamping set for transmitting torque and/or axial forces. 5,067,847, Cl. 403-370.000.

Mukai, Toshio; and Yamashita, Yoshiro, to Fuji Xerox Co., Ltd.; and Mukai, Toshio. Bis[1,2,5]thiadiazolo[3,4-b:3', 4'-e]pyrazine, a process for the preparation thereof and a method of using same. 5,068,328, Cl. 544-350.000.

Mukoh, Akio: *See*—
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Muller, Dietmar; and Bauer, Helmut, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Process and apparatus for producing propellant charge granular material. 5,068,066, Cl. 264-3.300.

Muller, Erich; Nickl, Josef, deceased (by Nickl, Erma, executor); Heckel, Armin; and Engelhardt, Gunther, to Karl Thomae GmbH. Pharmaceutical compositions containing quinolin-2,5-diones, new quinolin-2,5-diones and processes for the preparation thereof. 5,068,334, Cl. 546-157.000.

Muller, Michael; and Podszun, Wolfgang, to Bayer Aktiengesellschaft. Formylpiperazinyl-(meth)acrylic acid derivatives for treatment of collagen. 5,068,264, Cl. 522-167.000.

Muller, Peter-Rolf: *See*—
Horn, Klaus; Heinz, Hans-Detlef; Muller, Peter-Rolf; and Dujardin, Ralf, 5,068,311, Cl. 528-324.000.

Muller, R. M., to Multifastener Corporation. Method of installing self-attaching fastener and apparatus. 5,067,224, Cl. 29-432.200.

Muller, Robert; and Eisenhauer, Egon, to Dr. Ing. h.c.F. Porsche AG. Drive assembly for motor vehicles. 5,067,582, Cl. 180-380.000.

Multifastener Corporation: *See*—
Muller, R. M., 5,067,224, Cl. 29-432.200.

Mumford, Glen: *See*—
Zimmermann, Clifton; and Mumford, Glen, 5,068,862, Cl. 372-25.000.

Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, to Petroleo Brasileiro S.A. - Petrobras. Apparatus for securing oil, gas and by-products from pyrobituminous shale and other matter impregnated with hydrocarbons. 5,068,010, Cl. 202-99.000.

Munter, Beverly L. Doll for simulating weight loss/gain. 5,067,924, Cl 446-320.000.

Munzer, John: *See*—
Bruckert, William; Kovalcin, David; Bissett, Thomas D.; Munzer, John; Mazur, Dennis; Mott, Peter R., Jr.; Dearth, Glenn A.; Alonso, Carlos; and Katan, Ann, 5,068,780, Cl. 395-700.000.

Muraishi, Katsuaki; Onishi, Masahiro; Mori, Nobufumi; Nunome, Hiromi; and Oikawa, Tetsuo, to Jeol Ltd.; and Fuji Photo Film Co., Ltd. Dispenser for dispensing sheets of an alternating first and second kind from a stack. 5,067,702, Cl. 271-134.000.

Muraishi, Teruo: *See*—
Tsumura, Ryuichiro; Muraishi, Teruo; Ideda, Keiichi; and Wang, Jin-Kai, 5,068,357, Cl. 548-548.000.

Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, to Hitachi, Ltd. Semiconductor device. 5,068,712, Cl. 357-72.000.

Murakami, Katsuhiko; Yamagami, Nobuo; Nakanishi, Toshiyuki; Nakano, Iwao; Kobayashi, Keiichi; and Yokhikawa, Takashi, to NKK Corporation; Japan Marine Science and Technology Center; and Oki Electric Industry Co., Ltd. Method for manufacturing alloy rod having giant magnetostriction. 5,067,551, Cl. 164-122.200.

Murakami, Keishi, to Mitsubishi Denki Kabushiki Kaisha. Equalizer. 5,068,873, Cl. 375-13.000.

Murakami, Masahiro: *See*—
Ito, Yoshihiko; and Murakami, Masahiro, 5,068,381, Cl. 556-431.000.
Murakami, Tadayoshi: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.
Murakami, Yoshihide: *See*—
Kawai, Akira; and Murakami, Yoshihide, 5,068,067, Cl. 264-4.700.
Muramatsu, Motoyasu: *See*—
Kushi, Naoto; Takaoka, Toshio; and Muramatsu, Motoyasu, 5,067,579, Cl. 180-197.000.
Murata, Atsuhiko: *See*—
Oda, Goichi; Shidoh, Masaya; Toda, Atsushi; Ozaki, Akiyoshi; Matsumoto, Akihiro; Yagi, Soichi; and Murata, Atsuhiko, 5,068,570, Cl. 315-128.000.
Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Okada, Takekazu; Dejima, Hiroki; and Tokudera, Hiromu, 5,068,629, Cl. 333-1.100.
Murata, Mitsuo; Yokoo, Chihiro; and Hanada, Kazunori, to Taisho Pharmaceutical Co., Ltd. Epoxysuccinic acid derivatives. 5,068,354, Cl. 548-517.000.
Murata, Yasumoto: *See*—
Yoshikawa, Shuuichi; Watanabe, Masahiko; Ikeuchi, Michio; Murata, Yasumoto; and Nakano, Takahiko, 5,068,876, Cl. 375-80.000.
Muratore, Antonio: *See*—
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Murayama, Takayuki: *See*—
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Muri, Werner: *See*—
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Murnane, James F., III; and Kuhnle, William G., to United States of America, Army. Flexible wing. 5,067,410, Cl. 102-489.000.
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Backer, Marcella R.; Cavender, Ralston; Elder, Melanie L.; Jones, Peter C.; and Murphy, James A., 5,067,975, Cl. 65-3.120.
Murray, Robert B., III: *See*—
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Fawzi, Mahdi B.; Kubert, Daniel A.; and Murthy, Kuchi S., 5,068,110, Cl. 424-461.000.
Murtiashaw, Charles W.; and Quallich, George J., to Pfizer Inc. 6-chloro-3,4-dihydro-pyrano [2,3-b]pyridines having the R configuration. 5,068,333, Cl. 546-116.000.
Murugan, Muthu K., to Allied-Signal Inc. Generator with bearing-retaining stator. 5,068,557, Cl. 310-90.000.
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Linkletter, Don R.; and Musil, Joseph E., 5,067,254, Cl. 34-137.000.
Musschoot, Albert, to General Kinematics Corporation. Compaction apparatus and process for compacting sand. 5,067,549, Cl. 164-39.000.
Myer, John M.: *See*—
Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,067,916, Cl. 439-857.000.
Myers, James H. Safety guard apparatus. 5,067,586, Cl. 182-45.000.
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Klemann, Lawrence P.; and Finley, John W., 5,068,119, Cl. 426-601.000.
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Nagai, Yataro; Matsushita, Mitsuyoshi; and Yamauchi, Yuji, to Tanken Seiko Kabushiki Kaisha. Mechanical seal including a split seal ring. 5,067,733, Cl. 277-11.000.
Nagaishi, Hatsuo, to Nissan Motor Company, Limited. System for measuring air flow rate for internal combustion engines. 5,067,466, Cl. 123-494.000.
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Kubo, Eiichi; Kammuri, Yoshihiro; Nagaoka, Koichi; Kitahara, Takeshi; Miyahara, Yoshiki; Kiriyama, Syunichi; and Mishima, Yasunobu, 5,068,141, Cl. 428-219.000.
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Nagashima, Toshiharu: *See*—
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Nakada, Tadao: *See*—
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Nakahara, Norito: *See*—
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Nakajima, Hiromi, to Liner Kabouki Co., Ltd.; and Mitsui & Co., Ltd. Powder feeder in continuous casting. 5,067,553, Cl. 164-412.000.
Nakajima, Kazutoshi: *See*—
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Nakamura, Akihiro: *See*—
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Nakamura, Kosei, to Fanuc Ltd. Spindle drive control apparatus for a machine tool. 5,068,587, Cl. 318-771.000.
Nakamura, Kouzaburou: *See*—
Maruno, Tohru; Ishibashi, Shigeki; and Nakamura, Kouzaburou, 5,068,261, Cl. 522-39.000.
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Nakamura, Tamiya: *See*—
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Nakamura, Yoshinobu; Sannohe, Kanetaro; Sohama, Yoshio; Iwasaki, Toru; and Yamano, Sumiko, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Copper powder for electroconductive paints and electroconductive paint compositions. 5,068,150, Cl. 428-407.000.

Nakamura, Yoshinobu, to Sumitomo Rubber Industries, Ltd. Golf ball. 5,068,151, Cl. 428-407.000.

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Nakanishi, Mutsuo: *See*—
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Nakano, Fumio: *See*—
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Nakano, Iwao: *See*—
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Nakano, Koji: *See*—
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Nakano, Masaki, to Nissan Motor Co., Ltd. Toroidal continuously variable transmission. 5,067,360, Cl. 74-200.000.

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Nakano, Takahiko: *See*—
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Nakano, Yasuhiko: *See*—
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Nakase, Ryoichi; and Mineo, Shigeharu, to Sanshin Industries Co., Ltd. Exhaust cooling device for small sized boat engine. 5,067,448, Cl. 123-41.310.

Nakatani, Keiji; and Yamada, Hirokazu, to Minolta Camera Kabushiki Kaisha. Copying apparatus with image editing device. 5,068,690, Cl. 355-218.000.

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Namanny, Keith E.: *See*—
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Narula, Anubhav P. S.; and De Virgilio, John J., to International Flavors & Fragrances Inc. Cyclohexenylmethloxabicyclooctanes, processes for preparing same, intermediates used in said processes and organoleptic uses of said cyclohexenylmethloxabicyclooctanes and intermediates therefor. 5,068,363, Cl. 549-355.000.

Naruse, Hideaki: *See*—
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Bosnyak, Robert J., 5,068,551, Cl. 307-475.000.
Wright, Michael E., 5,068,593, Cl. 323-315.000.

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Gallaway, George L.; and Foreman, Paul B., 5,068,291, Cl. 525-366.000.

Natonal Metal and Refining Company, Inc.: *See*—
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Natterer, Johann: *See*—
Wirth, Lawrence W.; Wegner, Wayne M.; Tomic, Mladomir; Buchko, Raymond; and Natterer, Johann, 5,067,822, Cl. 383-61.000.

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NEC Corporation: *See*—
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Negaty-Hindi, Guy: *See*—
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Negi, Taichi; Hirofuji, Satoshi; Tanaka, Nobuo; and Kawai, Syuji, to Kuraray Co., Ltd. Process of vacuum-air pressure drawing of a laminate containing an EVOH/polyamide copolymer. 5,068,077, Cl. 264-512.000.

Negishi, Koichi, to Bridgestone Corporation. Double-acting flexible wall actuator. 5,067,390, Cl. 92-48.000.

Nelson, Bruce D.: *See*—
Vespoli, Michael; Nelson, Bruce D.; Scragg, Carl; and Fuchs, Paul, 5,067,426, Cl. 114-56.000.

Nelson, Charles J.; Bheda, Jayendra H.; Rim, Peter B.; and Turner, James M., to Allied-Signal Inc. Dimensionally stable polyester yarn for highly dimensionally stable treated cords and composite materials such as tires made therefrom. 5,067,538, Cl. 152-451.000.

Nelson, Joyce K.: *See*—
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Johnson, Roger D., 5,067,645, Cl. 225-93.000.
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Netzel, Karl-Hermann, to HPO Hanseatische Prazisions-und Orbittechnik GmbH. Method and apparatus for non-contact measuring and, in case, abrasive working of surfaces. 5,067,282, Cl. 51-165.770.

Neudeck, Gerold W.: *See—*
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Newell, Florine: *See—*
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Motion, Keith R.; and Newman, Christopher P., 5,068,466, Cl. 568-781.000.
Newman, Robert A., to Advanced Micro Devices, Inc. Ground plane for plastic encapsulated integrated circuit die packages. 5,068,708, Cl. 357-68.000.
Newton, John: *See—*
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NGK Spark Plug Company, Ltd.: *See—*
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Nicholas, David M.: *See—*
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Nichols, Robert N., to Robles, Jerry. Hypodermic needle guard. 5,067,944, Cl. 604-192.000.
Nickel, Wolf-Ulrich; Ruger, Wolfgang; Urbach, Hansjorg; and Hock, Franz, to Hoechst Aktiengesellschaft. Pyrrolidine-2-carboxylic acid derivatives and their use for psychotropic action. 5,068,242, Cl. 514-412.000.
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Nicklas, James R.; Bright, Gerald; Pullen, Eric V., deceased (by Pullen, Antoinette D., Legal Representative); and Nicklas, James R., to Masco Corporation. Thermostatic pressure balanced valve assembly. 5,067,513, Cl. 137-98.000.
Nicklas, James R.: *See—*
Nicklas, James R.; Bright, Gerald; Pullen, Eric V., deceased; and Nicklas, James R., 5,067,513, Cl. 137-98.000.
Nicol, Alexander N. Articulated drive with a belt and pulley arrangement. 5,067,581, Cl. 180-254.000.
Nieh, Edward C. Y., to Texaco Chemical Company. Preparation of nonionic surfactants by oxyalkylation with a phenolic activated magnesium catalyst. 5,068,456, Cl. 568-618.000.
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Niewold, D. Wayne; and Bradley, Richard A., to Power Planter, Inc. Auger planter. 5,067,571, Cl. 175-394.000.
Nifco Inc.: *See—*
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Nigro, William A.; and O'Neill, Gary A., to Aluminum Company of America. Method for reducing the amount of colorants in a caustic liquor. 5,068,095, Cl. 423-122.000.
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Nakano, Shohkichi; and Matsushita, Akira, 5,068,619, Cl. 324-715.000.
Niiyama, Akira: *See—*
Kikuchi, Hideaki; Ogawa, Motosuke; and Niiyama, Akira, 5,068,051, Cl. 252-162.000.
Nikaido, Yuko: *See—*
Ashina, Yoshiro; Fujita, Takeyuki; Niwa, Kiyonobu; Inagaki, Takeshi; and Nikaido, Yuko, 5,068,442, Cl. 564-479.000.
Nikko Bio Technica Co., Ltd.: *See—*
Imanaka, Tadayuki; and Sakurai, Shoji, 5,068,194, Cl. 435-252.500.
Nikon Corporation: *See—*
Ohno, Kou; Hattori, Tetsuo; and Matsumoto, Tsuyoshi, 5,068,529, Cl. 250-231.180.
Utagawa, Ken, 5,068,682, Cl. 354-402.000.
Nilssen, Ole K. Combined signal and electrical power distribution system. 5,068,890, Cl. 379-90.000.
Nimpoeno, Roy, to Scosche Industries, Inc. Marine stereo cover with detenting hinge. 5,068,765, Cl. 361-422.000.
Ninomiya, Takeshi: *See—*
Takayama, Jun; Fujita, Tadao; and Ninomiya, Takeshi, 5,068,716, Cl. 358-13.000.
Nippon Ferrofluidics Corporation: *See—*
Yamamura, Akira, 5,068,558, Cl. 310-90.500.
Nippon Kayaku Kabushiki Kaisha: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 5,068,376, Cl. 556-137.000.
Nippon Oil & Fats Co., Ltd.: *See—*
Sawada, Hideo; and Nakayama, Masaharu, 5,068,454, Cl. 568-566.000.
Yamamoto, Shosaku; and Kakinuma, Kazuo, 5,068,287, Cl. 525-124.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Kasuga, Shinichi, 5,067,823, Cl. 384-45.000.
Nippon Steel Chemical Co., Ltd.: *See—*
Kaji, Masashi; Aramaki, Takanori; Nakahara, Norito; and Yamada, Yasuharu, 5,068,293, Cl. 525-534.000.
Nippon Steel Corporation: *See—*
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,067,447, Cl. 123-3.000.
Nippon Telegraph and Telephone Corporation: *See—*
Maruno, Tohru; Ishibashi, Shigeki; and Nakamura, Kouzaburou, 5,068,261, Cl. 522-39.000.
Nippon Unicar Company Limited: *See—*
Isobe, Kazuyuki; Aizawa, Takao; Yamaguchi, Noboru; and Ueda, Yutaka, 5,068,270, Cl. 524-68.000.
Nippondenso Co., Ltd.: *See—*
Okajima, Atsushi; Yamazaki, Yasuou; Okamoto, Yasuhide; Nozawa, Masaei; Takeuchi, Yukihisa; and Akado, Hajime, 5,067,455, Cl. 123-196.00R.
Nishi, Kunihiko: *See—*
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.
Nishiguchi, Keizo: *See—*
Matsuura, Kazuo; Sekino, Hitoshi; Nishiguchi, Keizo; and Yoshida, Narutaka, 5,068,677, Cl. 346-108.000.
Nishikawa, Kazuhiro: *See—*
Nogami, Mamoru; and Nishikawa, Kazuhiro, 5,068,539, Cl. 250-492.200.
Nishikawa, Shigeru: *See—*
Hagino, Sadaaki; Suzuki, Motokazu; Kondo, Hideyuki; Nishikawa, Shigeru; and Hayashi, Kenichi, 5,068,219, Cl. 505-1.000.
Nishikawa, Toshio; Okada, Takekazu; Dejima, Hiroki; and Tokudera, Hiromu, to Murata Manufacturing Co., Ltd. Nonreciprocal circuit element. 5,068,629, Cl. 333-1.100.
Nishimoto, Shigekazu: *See—*
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.
Nishimura, Asao: *See—*
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.
Nishimura, Tetsuharu: *See—*
Ishizuka, Kou; Nishimura, Tetsuharu; Tsukiji, Masaaki; and Ishii, Satoshi, 5,067,813, Cl. 356-351.000.
Nishino, Hideki: *See—*
Watanabe, Tan; Nishino, Hideki; Iwami, Hidefumi; and Tabata, Kuniaki, 5,068,804, Cl. 395-147.000.
Nishio, Yukio; and Hirose, Kazunori, to Fujitsu Limited. Developing device with a controllable pressure release for the developing roller. 5,068,691, Cl. 355-259.000.
Nishiura, Akira; Kumagai, Naoki; and Seki, Yasukazu, to Fuji Electric Co., Ltd. Horizontal deflection circuit for high-frequency scanning. 5,068,581, Cl. 315-370.000.
Nishiya, Takayuki: *See—*
Takahama, Yoshihiro; Kurihara, Kazushige; and Nishiya, Takayuki, 5,067,288, Cl. 52-80.000.
Nishiyama, Satoshi, to Sumitomo Electric Industries, Ltd. Fiber identification in an optical fiber composite overhead ground wire. 5,067,791, Cl. 385-101.000.
Nishizawa, Kimiyoshi, to Nissan Motor Co., Ltd. Honeycomb metal catalyst apparatus. 5,068,218, Cl. 502-439.000.
Nissan Motor Company, Ltd.: *See—*
Hirabayashi, Hirokazu, 5,067,744, Cl. 280-734.000.
Kanesaki, Nobukazu, 5,067,320, Cl. 60-297.000.
Nagaishi, Hatsuo, 5,067,466, Cl. 123-494.000.
Nakano, Masaki, 5,067,360, Cl. 74-200.000.
Nishizawa, Kimiyoshi, 5,068,218, Cl. 502-439.000.
Shinzawa, Motohiro, 5,067,457, Cl. 123-269.000.
Suzuki, Yutaka, 5,067,372, Cl. 74-866.000.
Yoshikawa, Hironori, 5,067,745, Cl. 280-735.000.
Nisshin Steel Co., Ltd.: *See—*
Ban, Takeshi; Matsunaga, Shigeru; Hirano, Hidemi; Isobe, Tuguo; and Takakura, Yoshio, 5,067,555, Cl. 164-480.000.

Nissin Electric Company, Limited: *See—*
Nogami, Mamoru; and Nishikawa, Kazuhiro, 5,068,539, Cl. 250-492.200.

Niswonger, David S.: *See—*
Bourgoin, Jodi A.; Freeburne, Steven K.; Halm, Roland L.; Naasz, Brian M.; Niswonger, David S.; and VanKoevering, Dennis G., 5,068,383, Cl. 556-452.000.

Nitrokemia Ipartelepek: *See—*
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 5,068,424, Cl. 562-870.000.

Nitschke, Werner: *See—*
Burger, Wilfried; Nitschke, Werner; Taufer, Peter; and Weller, Hugo, 5,068,640, Cl. 340-438.000.

Nitto Denko Corporation: *See—*
Kuroda, Yasuhiro; and Suzuki, Hideo, 5,067,290, Cl. 52-208.000.
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,297, Cl. 359-76.000.

Nitto Kagaku Kogyo Kabushiki Kaisha: *See—*
Ashina, Yoshiro; Fujita, Takeyuki; Niwa, Kiyonobu; Inagaki, Takeshi; and Nikaido, Yuko, 5,068,442, Cl. 564-479.000.

Niwa, Katsuhito: *See—*
Tagami, Shigeru; Umedu, Yoshio; and Niwa, Katsuhito, 5,068,562, Cl. 310-256.000.

Niwa, Kiyonobu: *See—*
Ashina, Yoshiro; Fujita, Takeyuki; Niwa, Kiyonobu; Inagaki, Takeshi; and Nikaido, Yuko, 5,068,442, Cl. 564-479.000.

NKK Corporation: *See—*
Murakami, Katsuhiko; Yamagami, Nobuo; Nakanishi, Toshiyuki; Nakano, Iwao; Kobayashi, Keiichi; and Yokhikawa, Takashi, 5,067,551, Cl. 164-122.200.

Noda Institute for Scientific Research: *See—*
Horiuchi, Tatsuo; and Kurokawa, Toshiko, 5,068,190, Cl. 435-190.000.

Noda, Kazuo: *See—*
Samejima, Masayoshi; Noda, Kazuo; Hirakawa, Yoshiyuki; and Yoshino, Hiroyuki, 5,068,112, Cl. 424-495.000.

Noda, Masanori; and Nakamura, Akihiro, to Sony Corporation. Semiconductor memory which is protected from erasure by light shields. 5,068,697, Cl. 357-23.500.

Noda, Shoji: *See—*
Uchida, Kiyoshi; Noda, Shoji; and Higuchi, Kazuo, 5,068,871, Cl. 373-17.000.

Noetzel, Andrew S. Interplating memory function evaluation. 5,068,816, Cl. 364-718.000.

Nogami, Mamoru; and Nishikawa, Kazuhiro, to Nissin Electric Company, Limited. Ion implantation apparatus. 5,068,539, Cl. 250-492.200.

Nogawa, Hayabu: *See—*
Uchida, Tadahiro; Shimamura, Kuniyuki; Nogawa, Hayabu; Saito, Keikichi; and Hara, Minoru, 5,067,938, Cl. 494-12.000.

Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Resin composition curable with an active energy ray containing half-esterificated epoxy resin and monomer having ethylenically unsaturated bond. 5,068,257, Cl. 522-31.000.

Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Resin composition curable with an active energy ray containing half-esterificated epoxy resin as a constituent. 5,068,258, Cl. 522-31.000.

Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Resin composition curbable with an active energy ray containing epoxy resin and monomer with ethylenically unsaturated bond. 5,068,259, Cl. 522-31.000.

Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Resin composition curable with an active energy ray containing epoxy resin containing at least a compound having one or more of epoxy group in the molecule. 5,068,260, Cl. 522-31.000.

Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Resin composition curable with an active energy ray containing photopolymerizable polyurethane. 5,068,262, Cl. 522-95.000.

Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Resin composition curable with an active energy ray containing graft copolymerized polymer with trunk chain containing dicyclopentenyl group. 5,068,263, Cl. 522-109.000.

Nojima, Satoshi; Sakagawa, Kazuo; and Suzuki, Hideo, to Fujitsu Limited. Data transfer system having transfer discrimination circuit. 5,068,820, Cl. 395-275.000.

Nomura, Yukitaka: *See—*
Shinkai, Kunio; Suzuki, Toyoo; Nomura, Yukitaka; Kurachi, Yoshio; and Kureishi, Hiroyuki, 5,067,204, Cl. 19-159.00A.

Nonaka, Hiromi: *See—*
Suzuki, Fumio; Shimada, Junichi; Kubo, Kazuhiro; Ohno, Tetsuji; Karasawa, Akira; Ishii, Akio; and Nonaka, Hiromi, 5,068,236, Cl. 514-263.000.

Nonoyama, Makoto, to Kabushiki Kaisha Toshiba. Image reading apparatus. 5,068,747, Cl. 358-448.000.

NorAm Chemical Company: *See—*
Smythe, Stephen R.; Cole, Martin G.; and Grier, James S., 5,068,443, Cl. 564-496.000.

Norddeutsche Faserwerke GmbH: *See—*
Behl, Klaus; Erren, Karl-Heinz; and Mantz, Ekkehard, 5,067,215, Cl. 28-190.000.

Nordica S.p.A.: *See—*
Martignago, Pietro, 5,067,258, Cl. 36-117.000.

Nordson Corporation: *See—*
DeVries, James E.; Rosen, Samuel R.; and Schneider, Robert D., 5,067,882, Cl. 417-511.000.

Noristi, Luciano: *See—*
Albizzati, Enrico; Morini, Giampiero; Giannini, Umberto; Barino, Luisa; Scordamaglia, Raimondo; Barbe, Pier C.; and Noristi, Luciano, 5,068,213, Cl. 502-126.000.

Norita, Toshio: *See—*
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Ishida, Tokuji; Hamada, Masataka; and Norita, Toshio, 5,068,737, Cl. 358-227.000.

Norman, Alan B.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 5,067,499, Cl. 131-194.000.

Norrie, Lyle W. Product support apparatus. 5,067,620, Cl. 211-113.000.

Norsolor: *See—*
Brusson, Jean M.; Bujadoux, Karel; Petit, Francis; Fuchs, Jean M.; and Mortreux, Andre , 5,068,014, Cl. 204-59.00M.

Nortenius, Bengt-Arne; Olsson, Per-Erik B.; and Grip, Nils-Erik G., to Telefonaktiebolaget L M Ericsson. Linear measuring apparatus. 5,067,248, Cl. 33-744.000.

North American Philips Corporation: *See—*
Bruning, Gert W.; and Veldman, Paul R., 5,068,573, Cl. 315-209.00R.

Northeastern University: *See—*
Wise, Donald L.; Augenstein, Don C.; and Gresser, Joseph D., 5,068,188, Cl. 435-140.000.

Northern Telecom Limited: *See—*
Ellis, John G.; and Townsend, Bruce L., 5,068,899, Cl. 381-31.000.

Nose, Kenkichi; Takata, Tadahiko; and Tsuge, Masuo, to Teijin Limited. Fiber-reinforced polymeric resin composite material and process for producing same. 5,068,142, Cl. 428-232.000.

Notardonato, Luigi: *See—*
Bjerklund, Gunnar; Ore, William C.; Pulawski, Casimir; and Notardonato, Luigi, 5,067,507, Cl. 137-3.000.

Nova, Wallace B. Pulling attachment for flexible conduit. 5,067,843, Cl. 403-301.000.

Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, to Nippon Kayaku Kabushiki Kaisha. Novel platinum complexes. 5,068,376, Cl. 556-137.000.

Nowinski, Robert C., to Genetic Systems Corporation. Method of enhancing direct immunofluorescence staining of cells. 5,068,178, Cl. 435-7.200.

Nozawa, Masaei: *See—*
Okajima, Atsushi; Yamazaki, Yasuou; Okamoto, Yasuhide; Nozawa, Masaei; Takeuchi, Yukihisa; and Akado, Hajime, 5,067,455, Cl. 123-196.00R.

Nuber, Roland; Schubert, Werner; Sohler, Wolfgang; and Sutter, Franz, to Wankel GmbH. Machine unit consisting of a rotary piston internal combustion engine and a rotary piston compressor. 5,067,557, Cl. 165-51.000.

Nudd, Barry C.; and Chambers, James W., to Atwood Industries, Inc. Swivel jack for a trailer tongue. 5,067,692, Cl. 254-420.000.

Numata, Masanori, to Nifco Inc. Device for opening and closing lid. 5,067,625, Cl. 220-343.000.

Nunome, Hiromi: *See—*
Muraishi, Katsuaki; Onishi, Masahiro; Mori, Nobufumi; Nunome, Hiromi; and Oikawa, Tetsuo, 5,067,702, Cl. 271-134.000.

Nuriya, Kozo: *See—*
Kaneaki, Tetsuhiko; Nuriya, Kozo; and Tani, Yasunori, 5,068,661, Cl. 341-143.000.

Nusair, Marwan E.: *See—*
Valentine, Michael D.; Scholl, Stephen R.; and Nusair, Marwan E., 5,068,663, Cl. 342-20.000.

Nutt, Gerald L., to United States of America, Energy. Method for enhancing stability of high explosives, for purposes of transport or storage, and the stabilized high explosives. 5,067,995, Cl. 149-2.000.

N.V. Nederlandsche Apparatenfabriek Nedap: *See—*
Hogen Esch, Johannes H. L., 5,068,641, Cl. 340-551.000.

Oatman, Kenneth G.: *See—*
Mims, William F., Jr.; Bramlett, Richard T.; and Oatman, Kenneth G., 5,067,587, Cl. 182-63.000.

Oberdorfer-Bogel, Rainer. Dust exhauster for a vacuum cleaner having improved cooling. 5,068,555, Cl. 310-52.000.

OCE-Nederland B.V.: *See—*
van Vliembergen, Eduardus J. W., 5,068,789, Cl. 364-419.000.
Verhelst, Paulus W. E.; Winiger, Werner J.; and Collard, Rene F. A., 5,068,809, Cl. 395-145.000.

O'Connor, Richard J. Child powered bicycle trailer. 5,067,738, Cl. 280-204.000.

Oda, Goichi; Shidoh, Masaya; Toda, Atsushi; Ozaki, Akiyoshi; Matsumoto, Akihiro; Yagi, Soichi; and Murata, Atsuhiko, to Koito Manufacturing Co., Ltd. Lamp lighting circuit with an overload protection capability. 5,068,570, Cl. 315-128.000.

Odaka, Masanori: *See—*
Miyaoka, Shuuichi; Odaka, Masanori; Arai, Toshikazu; and Higuchi, Hiroshi, 5,068,828, Cl. 365-189.010.

Oddi, Frederick V.: *See—*
Joshi, Shrikant M.; and Oddi, Frederick V., 5,067,561, Cl. 165-140.000.

Oertel, Christopher P.: *See—*
Donohoue, Thomas P.; Oertel, Christopher P.; Tyree, William H.; and Valdez, Joe L., 5,067,820, Cl. 374-31.000.

Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., to Texas Instruments Incorporated. Supplemental automotive vehicular heater system and method of providing same. 5,068,589, Cl. 322-7.000.

Offner, Dennis. Fixture for hinge mortise. 5,067,537, Cl. 144-372.000.

Oftring, Alfred: *See*—
Baur, Richard; Gousetis, Charalampos; Trieselt, Wolfgang; Bochnitschek, Werner; and Oftring, Alfred, 5,068,416, Cl. 562-571.000.

Ogata, Masatsugu: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Ogata, Toshikazu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor package. 5,068,156, Cl. 428-620.000.

Ogata, Yoshinori; Kikuchi, Yutaka; Makino, Tsutomu; Kobayashi, Teruo; and Yoshida, Hirotaka, to Doryokuro Kakunenryo Kaihatsu Jigyodan; Ishikawajima-Harima Heavy Industries Co., Ltd.; and Dai-Ichi High Frequency Co., Ltd. Bus bar for power supply with coolant flow passages. 5,068,491, Cl. 174-16.200.

Ogawa, Hiroshi: *See*—
Fudono, Kanji; Takahashi, Toshimasa; Ogawa, Hiroshi; and Yamashita, Toshio, 5,067,556, Cl. 165-29.000.

Ogawa, Motosuke: *See*—
Kikuchi, Hideaki; Ogawa, Motosuke; and Niiyama, Akira, 5,068,051, Cl. 252-162.000.

Ogawa, Yoshihiko; Yasuki, Seijiro; and Kawai, Kiyoyuki, to Kabushiki Kaisha Toshiba. Band compressing/restoring apparatus. 5,068,725, Cl. 358-135.000.

Ogawa, Yoshikatsu; Hisada, Haruhiko; Kasahara, Takeshi; Kizaki, Fumihiko; and Yoshiya, Masahide, to Marubishi Yuka Kogyo Kabushiki Kaisha. Process for preparation of dibromopropyl ether compound having high melting point. 5,068,446, Cl. 568-33.000.

Ogawa, Youichi: *See*—
Kitakami, Osamu; Fujiwara, Hideo; Ojima, Kiyotaka; Ogawa, Youichi; and Wakai, Kunio, 5,068,144, Cl. 428-323.000.

Ogawa, Zensuke, to Kurita Water Industries, Ltd.; and Ogawa, Zensuke. Method for measurement of α-amylase activity. 5,068,183, Cl. 435-22.000.

Ogino, Masayuki: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Ogino, Masayuki; Miyagawa, Hitoshi; Kamata, Toshio; Watanabe, Mitsuo; and Miyashita, Kunihiro, 5,067,653, Cl. 239-18.000.

Ogiya, Shunsuke: *See*—
Ueda, Makoto; Sakurada, Koichi; Sakurai, Shungo; Yoshioka, Ritsuo; Ogiya, Shunsuke; and Nagano, Mamoru, 5,068,082, Cl. 376-428.000.

Ogura, Mutsuo: *See*—
Wang, Shing C.; Ogura, Mutsuo; Wang, Shyh; and Hsin, Wei, 5,068,869, Cl. 372-45.000.

Ogura, Wataru, to Chinon Kabushiki Kaisha. Image signal processor for reading dark and light characters from light and dark backgrounds respectively. 5,068,910, Cl. 382-50.000.

Oh, Tae S., to Samsung Electronics Co., Ltd. Heater with a humidifier. 5,067,473, Cl. 126-113.000.

Ohara, Shiro, to Fujitsu Limited. Josephson integrated circuit having a resistance element. 5,068,694, Cl. 357-5.000.

Ohfune, Yasufumi; Shimamoto, Keiko; Shinozaki, Haruhiko; and Ishida, Michiko, to Suntory Limited. (2R,3S,4S)-α-(carboxycyclopropyl)glycine. 5,068,412, Cl. 562-506.000.

Ohkawa, Tihiro, to General Atomics. Low hazard extremely low frequency power transmission line. 5,068,543, Cl. 307-91.000.

Ohki, Hiromi: *See*—
Takagaki, Hidetsugu; Nakanishi, Shigenori; Abe, Masayoshi; Ohki, Hiromi; and Sano, Yoshiyuki, 5,068,364, Cl. 549-415.000.

Ohkubo, Shinya: *See*—
Nakamura, Nobuyuki; Sakamoto, Yuji; Kawakami, Takashi; and Ohkubo, Shinya, 5,067,229, Cl. 29-566.100.

Ohlsson, Thomas; and Hjorth, Bo, to Siemens Aktiengesellschaft. Method and apparatus for analog-to-digital conversion. 5,068,658, Cl. 341-131.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, to Sumitomo Chemical Co., Ltd. Method for producing thermoplastic resin composition. 5,068,283, Cl. 525-64.000.

Ohmstede Mechanical Services, Inc.: *See*—
Boisture, Thomas B., 5,067,558, Cl. 165-95.000.

Ohnishi, Kenji; Washio, Isomi; and Nakano, Koji, to Amada Company, Limited. Vibration prevention device for bandsaw machines. 5,067,381, Cl. 83-820.000.

Ohno, Hiroyasu: *See*—
Yorozu, Kiyotaka; and Ohno, Hiroyasu, 5,068,455, Cl. 568-567.000.

Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Photographic wide angle lens. 5,067,803, Cl. 359-708.000.

Ohno, Kou; Hattori, Tetsuo; and Matsumoto, Tsuyoshi, to Nikon Corporation. Absolute position detection encoder. 5,068,529, Cl. 250-231.180.

Ohno, Motonori: *See*—
Nakamura, Takanori; Iwanaga, Sadaaki; Ohno, Motonori; and Miyazaki, Kyosuke, 5,068,314, Cl. 530-317.000.

Ohno, Tetsuji: *See*—
Suzuki, Fumio; Shimada, Junichi; Kubo, Kazuhiro; Ohno, Tetsuji; Karasawa, Akira; Ishii, Akio; and Nonaka, Hiromi, 5,068,236, Cl. 514-263.000.

O'Holleran, Thomas P., to KMS Fusion, Inc. Hollow spherical shell manufacture. 5,068,071, Cl. 264-56.000.

Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, to Canon Kabushiki Kaisha. Image processing apparatus. 5,068,746, Cl. 358-443.000.

Ohsawa, Toshio: *See*—
Iwata, Toshio; and Ohsawa, Toshio, 5,067,462, Cl. 123-414.000.

Ohshima, Yasunobu; and Shibanuma, Naoki, to NEC Corporation. Semiconductor laser module. 5,068,865, Cl. 372-36.000.

Ohta, Junichi: *See*—
Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, 5,067,979, Cl. 75-243.000.

Ohta, Kenji: *See*—
Nakayama, Junichiro; Katayama, Hiroyuki; and Ohta, Kenji, 5,068,841, Cl. 369-13.000.

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Ojima, Kiyotaka: *See*—
Kitakami, Osamu; Fujiwara, Hideo; Ojima, Kiyotaka; Ogawa, Youichi; and Wakai, Kunio, 5,068,144, Cl. 428-323.000.

Ok, Hyun: *See*—
Wyvratt, Matthew J., Jr.; Beattie, Thomas R.; Ok, Hyun; Arison, Byron H.; and Fisher, Michael H., 5,068,323, Cl. 540-456.000.

Okada, Kazuhiro: *See*—
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Okada, Masuhiro: *See*—
Inata, Hiroo; Matsumura, Shunichi; Itoh, Seiji; and Okada, Masuhiro, 5,068,062, Cl. 252-518.000.

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Takahashi, Wataru; Sugimoto, Yoshihito; Nakanishi, Mutsuo; Shida, Yoshiaki; and Okada, Minoru, 5,068,003, Cl. 148-421.000.

Okada, Takekazu: *See*—
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Oki Electric Industry Co., Ltd.: *See*—
Kishino, Kuniaki; and Nakamura, Tamiya, 5,068,784, Cl. 395-275.000.
Murakami, Katsuhiko; Yamagami, Nobuo; Nakanishi, Toshiyuki; Nakano, Iwao; Kobayashi, Keiichi; and Yokhikawa, Takashi, 5,067,551, Cl. 164-122.200.
Tanagawa, Kouji; and Yoshida, Tomoaki, 5,068,783, Cl. 395-575.000.
Tsubota, Takashi, 5,067,809, Cl. 357-17.000.

Okita, Ryozo, to Sanshin Industries Co., Ltd. Tilting/trimming system for marine propulsion unit. 5,067,919, Cl. 440-61.000.

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Watanabe, Hideomi; and Okita, Tsutomu, 5,068,145, Cl. 428-323.000.

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Egawa, Hidemitsu; Aoki, Riichirou; and Okumura, Katsuya, 5,068,709, Cl. 357-71.000.
Watanabe, Tohru; and Okumura, Katsuya, 5,067,437, Cl. 118-715.000.

Okura, Makoto: *See*—
Takebe, Hideharu; and Okura, Makoto, 5,068,651, Cl. 340-814.000.

Okura, Tsunetoshi: *See*—
Ando, Minato; Kato, Takashi; Aoki, Hideyasu; Mizushima, Yasuyuki; Okura, Tsunetoshi; and Kurokawa, Akemi, 5,068,542, Cl. 250-573.000.

O'Leary, Kevin P.: *See*—
Li, Alan Y.; Grutsch, James F.; and O'Leary, Kevin P., 5,068,036, Cl. 210-606.000.

O'Lenick, Anthony J., Jr., to LCE Partnership. Novel amphoteric polymers. 5,068,324, Cl. 540-471.000.

Olin Corporation: *See*—
—Raynor, Robert J.; and Duncan, Budd L., 5,068,408, Cl. 562-419.000.
—Schiessl, Henry W., 5,068,313, Cl. 528-483.000.

Olive, Patrick W.: *See*—
Brown, Robert T. K.; and Smith, Ronald W., 5,067,296, Cl. 52-309.700.

Oliver, Roy F.: *See*—
Buultjens, Travis E. J.; Jahoda, Colin A. B.; and Oliver, Roy F., 5,068,315, Cl. 530-324.000.

Olschansky, Scott: *See*—
Oschansky, Brad; Olschansky, Scott; and Lee, Raymond H., Jr., 5,067,708, Cl. 272-118.000.

Olson, Brennan J.; and Brace, Thomas J., to Rollerblade, Inc. Slotted brake for in-line roller skate. 5,067,736, Cl. 280-11.200.

Olson, Donald N.; and Huerta, Joseph, to United States of America, Army. Supersonic, low-drag, solid fuel ramjet tubular projectile. 5,067,406, Cl. 102-374.000.

Olson, Erlend M.: *See*—
Collins, Oliver; Dolinar, Samuel J., Jr.; Hus, In-Shek; Bozzola, Fabrizio P.; Olson, Erlend M.; Statman, Joseph I.; and Zimmerman, George A., 5,068,859, Cl. 371-43.000.

Olsson, Clas Ove: *See*—
Ahman, Jan-Olov L., 5,067,325, Cl. 62-77.000.

Olsson, Per-Erik B.: *See*—
Nortenius, Bengt-Arne; Olsson, Per-Erik B.; and Grip, Nils-Erik G., 5,067,248, Cl. 33-744.000.

Olympus Optical Co., Ltd.: *See*—
Kikuchi, Juro, 5,068,679, Cl. 354-271.100.
Shirakawa, Masaki, 5,067,800, Cl. 359-642.000.
Tsuji, Kiyoshi, 5,068,719, Cl. 358-98.000.

Omura, Takashi: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; and Omura, Takashi, 5,068,327, Cl. 544-76.000.

O'Neel, Timothy H., to Blount, Inc. Laminated adhesive core chain saw guide bar with containment and spacing wire. 5,067,243, Cl. 30-387.000.

O'Neill, Gary A.: *See*—
Nigro, William A.; and O'Neill, Gary A., 5,068,095, Cl. 423-122.000.

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Weinshenker, Ned M.; and O'Neill, William P., 5,068,226, Cl. 514-58.000.

Onishi, Masahiro: *See*—
Muraishi, Katsuaki; Onishi, Masahiro; Mori, Nobufumi; Nunome, Hiromi; and Oikawa, Tetsuo, 5,067,702, Cl. 271-134.000.

Onishi, Sei: *See*—
Yoshida, Susumu; Onishi, Sei; and Uchiyama, Kenji, 5,068,501, Cl. 200-61.58R.

Onnigian, Peter K.; and Onnigian, Philip M. Balanced antenna feed system. 5,068,672, Cl. 343-859.000.

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Onnigian, Peter K.; and Onnigian, Philip M., 5,068,672, Cl. 343-859.000.

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Kawazi, Toshikuni; Ono, Masahiro; and Inoue, Nobuko, 5,068,103, Cl. 424-81.000.

Onogi, Yukio: *See*—
Satake, Toshihiko; and Onogi, Yukio, 5,068,559, Cl. 310-112.000.

Ookubo, Satomi: *See*—
Shirata, Akihiro; Watanabe, Hideaki; Hagiya, Naoyuki; Ookubo, Satomi; and Moride, Shigeki, 5,067,578, Cl. 180-197.000.

Ootake, Yasuhiro: *See*—
Inukai, Sinji; Agata, Mitsuzi; Umezawa, Manami; Horio, Yoshihiro; Ootake, Yasuhiro; Sawaki, Shohei; and Goto, Masayoshi, 5,068,239, Cl. 514-381.000.

Ootani, Tetsuo: *See*—
Tsuyuki, Takao; Sato, Shigehiro; and Ootani, Tetsuo, 5,068,517, Cl. 219-543.000.

Opalko, Albert: *See*—
Archibald, John L.; Ward, Terence J.; and Opalko, Albert, 5,068,337, Cl. 514-256.000.

Opheij, Willem G.: *See*—
Braat, Josephus J. M.; and Opheij, Willem G., 5,068,751, Cl. 359-566.000.

Optum Corporation: *See*—
Filo, Andrew, 5,068,739, Cl. 358-237.000.

Ore, William C.: *See*—
Bjerklund, Gunnar; Ore, William C.; Pulawski, Casimir; and Notardonato, Luigi, 5,067,507, Cl. 137-3.000.

Oren, Josef: *See*—
Bekhazi, Michel; and Oren, Josef, 5,068,405, Cl. 562-83.000.

Orino, Kanjyo, to Canon Kabushiki Kaisha. Lens movement control device for zoom lens. 5,067,802, Cl. 359-700.000.

Oroskar, Anil R.: *See*—
Kulprathipanja, Santi; and Oroskar, Anil R., 5,068,418, Cl. 562-580.000.

Kulprathipanja, Santi; and Oroskar, Anil R., 5,068,419, Cl. 562-580.000.

Ortho-Vacon, Inc.: *See*—
Hollibush, Daniel J.; Fasnacht, Jeffery; and Eeg, Edward G., 5,068,107, Cl. 424-435.000.

Oscar Mayer Foods Corporation: *See*—
Kuethe, David F., 5,067,304, Cl. 53-410.000.

Oschansky, Brad; Olschansky, Scott; and Lee, Raymond H., Jr., to Lifeing, Inc. Multi-function exercise system. 5,067,708, Cl. 272-118.000.

O'Shaughnessy, Gerald M.: *See*—
Hemmings, John W.; Allan, Peter; and O'Shaughnessy, Gerald M., 5,067,972, Cl. 55-40.000.

Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, to Fuji Photo Film Co., Ltd. Apparatus for making booklets with photographs. 5,068,742, Cl. 358-296.000.

Oshima, Kazuyoshi: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Oshima, Takeshi: *See*—
Nakamura, Norio; Koike, Hiroyuki; and Oshima, Takeshi, 5,068,340, Cl. 548-119.000.

Osuna-Diaz, Jesus M. Injection molding apparatus with shut off valve pin actuation system. 5,067,893, Cl. 425-564.000.

Otani, Shinichi: *See*—
Kosugi, Hiromitsu; Otani, Shinichi; Kashino, Teruo; Andoh, Masakazu; Arai, Takeo; and Nagashima, Toshiharu, 5,068,681, Cl. 354-299.000.

Otowa, Hidekazu; Okada, Kazuhiro; Sonoda, Hidefumi; and Kaneko, Tadao, to Toyota Jidosha Kabushiki Kaisha. Apparatus for preventing discharge of fuel vapor. 5,067,468, Cl. 123-516.000.

Ott, Hans, to Gretag Aktiengesellschaft. Process for the determination of colorimetric differences between two screen pattern fields printed by a printing machine and process for the color control or ink regulation of the print of a printing machine. 5,068,810, Cl. 364-526.000.

Ouchi, Chidane, to Canon Kabushiki Kaisha. Illuminance distribution measuring system. 5,067,811, Cl. 356-121.000.

Ouderkirk, Dale L.; and Ouderkirk, Donald R. Foundation system for manufactured housing. 5,067,289, Cl. 52-169.110.

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Ouderkirk, Dale L.; and Ouderkirk, Donald R., 5,067,289, Cl. 52-169.110.

Owada, Nobuo; Horiuchi, Mitsuaki; Tsuneoka, Masatoshi; and Taneoka, Tadayuki, to Hitachi, Ltd. Semiconductor device with multilayer base contact. 5,068,710, Cl. 357-71.000.

Owatonna Tool Company: *See*—
Rypka, Dann B., 5,067,694, Cl. 269-20.000.

Oxford Science Industrial Co., Ltd.: *See*—
Chen, Chi-Min, 5,068,030, Cl. 210-95.000.

Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, to Mitsubishi Nuclear Fuel Co. Method of inserting fuel rods into a nuclear fuel assembly grid. 5,068,081, Cl. 376-261.000.

Oyama, Yoshio, to Yoshida Kogyo K.K. Method of and apparatus for assembling slide fastener sliders. 5,067,221, Cl. 29-409.000.

Ozaki, Akiyoshi: *See*—
Oda, Goichi; Shidoh, Masaya; Toda, Atsushi; Ozaki, Akiyoshi; Matsumoto, Akihiro; Yagi, Soichi; and Murata, Atsuhiko, 5,068,570, Cl. 315-128.000.

Ozaki, Keiichi: *See*—
Matsumoto, Etsuji; Araki, Mamoru; and Ozaki, Keiichi, 5,067,905, Cl. 439-76.000.

Ozawa, Osamu; Takahashi, Shuji; and Igarashi, Shigeru, to Yokohama Rubber Company, The. Rubbery laminate and composite hose. 5,068,137, Cl. 428-36.200.

Paige, Clive R., to Shop Vac Corporation. Pressure washer. 5,067,654, Cl. 239-124.000.

Paik, Woo H.: *See*—
Krause, Edward A.; Paik, Woo H.; Liu, Vincent; and Essserman, Jim, 5,068,724, Cl. 358-133.000.

Pal, Jack M.; Cosman, James P.; and Tan, Karen, to Dow Chemical Company, The. Polyurethane and/or polyurea dispersions in active hydrogen-containing compositions. 5,068,280, Cl. 524-728.000.

Palermo, Robert E.: *See*—
Han, Scott; Martenak, Daniel J.; Palermo, Robert E.; and Walsh, Dennis E., 5,068,486, Cl. 585-500.000.

Pangretic, Richard H., Jr.: *See*—
Bennett, Keith N.; and Pangretic, Richard H., Jr., 5,067,323, Cl. 60-734.000.

Panopoulos, Peter J. Variable point writing instrument. 5,067,837, Cl. 401-107.000.

Panten, Detlef; Naber, Dirk; and Bender, Franz, to Mercedes-Benz AG. Exhaust-gas recycling device for an internal-combustion engine. 5,067,470, Cl. 123-568.000.

Papavizas, George: *See*—
Lewis, Jack A.; Lumsden, Douglas; Papavizas, George; Hollenbeck, Martha D.; and Walter, James F., 5,068,105, Cl. 424-93.000.

Pappas, Panagiotis T.: *See—*
Cure, Jorge; Pappas, Panagiotis T.; and Eichler, Harry, 5,068,039, Cl. 210-695.000.

Paques, Eric P.; and Stohr, Hans-Arnold, to Behringwerke Aktiengesellschaft. t-PA solution of high concentration and use of the solution in human and veterinary medicine. 5,068,106, Cl. 424-94.300.

Parente, Richard E.; De La Cruz, Richard; and Helmstetter, Richard C., to Callaway Golf Company. Iron golf club heads. 5,067,711, Cl. 273-77.00A.

Parker, James. Anti-shaft effect motorcycle suspension. 5,067,580, Cl. 180-219.000.

Parker, Susan. Apparatus for grooming animals. 5,067,444, Cl. 119-85.000.

Parmenter, Ronald D., to Credence Systems Corporation. Dual function cam-ring system for DUT board parallel electrical inter-connection and prober/handler docking. 5,068,601, Cl. 324-158.00F.

Parriaux, Olivier: *See—*
Kotrotsios, Georges; and Parriaux, Olivier, 5,067,815, Cl. 356-345.000.

Paschal, Richard C. Air-water dental syringe with protective barrier. 5,067,899, Cl. 433-80.000.

Paspek, Stephen C.; Hauser, Jeffrey B.; Eppig, Christopher P.; and Adams, Harry A., to Standard Oil Company, The. Process for upgrading high-boiling hydrocaronaceous materials. 5,068,027, Cl. 208-125.000.

Patel, Arvind D.; McGlothlin, Raymond E.; Bleier, Roger D.; and Brinkley, H. N., to M-I Drilling Fluids Company. Oil based synthetic hydrocarbon drilling fluid. 5,068,041, Cl. 507-103.000.

Patel, Jayantilal S., to Bell Communications Research, Inc. Electronically tunable polarization-independent liquid crystal optical filter. 5,068,749, Cl. 359-93.000.

Patel, Kishor J.; and Stobbs, Thomas J., to Applied Power Inc. Proportional pressure control valve. 5,067,687, Cl. 251-129.080.

Patel, Narendra M.; and Di Leo, Leonard, to Sun Chemical Corporation. Thermosetting composition. 5,068,273, Cl. 524-166.000.

Patel, Nitin M.: *See—*
Bushinsky, Joseph P.; Nicholas, David M.; Wang, Shoou-I; and Patel, Nitin M., 5,068,058, Cl. 252-376.000.

Pattas, Konstatin N. Method of and an apparatus for regenerating a diesel particulate exhaust filter. 5,067,973, Cl. 55-96.000.

Patton, Samuel K.: *See—*
Tiggelbeck, Donald D.; and Patton, Samuel K., 5,068,029, Cl. 210-284.000.

Patwald, Wolfgang: *See—*
Auslander, Klaus; Fabris, Hans-Jurgen; Mock, Karl-Heinz; Patwald, Wolfgang; and Seichter, Helmut, 5,068,612, Cl. 324-327.000.

Paufve, Eldred H.; and Porterfield, Richard, to Universal Instruments Corporation. High frequency thermode driven device employing one-turn-secondary transformers. 5,068,509, Cl. 219-85.160.

Paul, Norbert; Huber, Rudolf; and Mielke, Ingolf, to Hoechst Aktiengesellschaft. Continuous telomerization process. 5,068,471, Cl. 570-139.000.

Pavese, Duilio: *See—*
Francioni, Renzo; and Pavese, Duilio, 5,067,307, Cl. 53-450.000.

Pavlik, Norman M.; Sefko, John; and Miller, Richard A., to ABB Power T & D Company, Inc. Drilling of steel sheet. 5,067,992, Cl. 148-307.000.

Payne, Lyle B.: *See—*
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,067,867, Cl. 414-391.000.

Pedain, Josef; Kahl, Lothar; and Weber, Karl-Arnold, to Bayer Aktiengesellschaft. Stabilized polyisocyanates. 5,068,402, Cl. 560-331.000.

Pedain, Josef: *See—*
Meixner, Jurgen; Pedain, Josef; Hohlein, Peter; and Kreuder, Hans-Joachim, 5,068,305, Cl. 528-49.000.

Pedrotti, Kenneth D.: *See—*
Sullivan, Gerard J.; Pedrotti, Kenneth D.; and Kroemer, Herbert, 5,067,828, Cl. 385-3.000.

Peiffer, Dennis G.; and Lundberg, Robert D., to Exxon Research and Engineering Company. Novel polyampholyte compositions possessing high degrees of acid, base, or salt tolerance in solution. 5,068,278, Cl. 524-547.000.

Pelletier, Michel, to Bombardier Inc. Variable geometry tiller. 5,067,263, Cl. 37-220.000.

Pelt & Hooykaas B.V.: *See—*
Hooykaas, Carel W. J., 5,067,981, Cl. 106-790.000.

Pendell, Barry J.: *See—*
Petigara, Ramesh B.; Leister, Norman A.; Pendell, Barry J.; and Woodruff, Robert A., 5,068,344, Cl. 548-213.000.

Pennell, Phillip E.; Blackmore, John M.; and Allen, Mark D., to MDR Group, Inc. Viscoelastic fluid for use in surgery and other therapies and method of using same. 5,068,225, Cl. 514-57.000.

Penning, Trevor M.; and Askonas, Leslie J., to University of Pennsylvania, Trustees of. Irreversible ligands for nonsteroidal antiinflammatory drug and prostaglandin binding sites. 5,068,250, Cl. 514-506.000.

Pennings, Albert J.; and Roukema, Mees, to Akzo N.V. Method of manufacturing polyethylene fibers by high speed spinning of ultra-high-molecular-weight polyethylene. 5,068,073, Cl. 264-205.000.

Pentair, Incorporated: *See—*
Fehlig, Kenneth L., 5,067,591, Cl. 184-55.100.

Periana, Roy A.; and Schaefer, George F., to Monsanto Company. Oxidation of tertiary-alkyl substituted aromatics. 5,068,407, Cl. 562-416.000.

Perkinson, Seth, to CDP Product Development Corporation. Diffuser screen for sparger nozzle. 5,067,559, Cl. 165-112.000.

Pessina, Gianluigi: *See—*
Camin, Daniel V.; Pessina, Gianluigi; and Previtali, Ezio, 5,068,623, Cl. 330-277.000.

Petainer S.A.: *See—*
Torsten, Nilsson, 5,067,888, Cl. 425-387.100.

Peter, John H.; Timm, Gerald L.; and Wiedenbeck, Roger D., to Johnson Corporation, The. Air controlled rotary joint compensator. 5,067,824, Cl. 384-99.000.

Peter Wolters AG: *See—*
Hollmann, Frank P., 5,067,203, Cl. 19-114.000.

Petersen, Richard A.: *See—*
Fordham, Donald S.; Petersen, Richard A.; and Gorbet, Charles E., 5,067,901, Cl. 434-224.000.

Petersen, Wayne E., to Dow Chemical Company, The. Method for plaza deck construction. 5,067,298, Cl. 52-741.000.

Peterson, Daryl. Annular base mold. 5,067,686, Cl. 249-57.000.

Petigara, Ramesh B.; Leister, Norman A.; Pendell, Barry J.; and Woodruff, Robert A., to Rohm and Haas Company. Process for the preparation of salt free, water free 3-isothiazolone compounds. 5,068,344, Cl. 548-213.000.

Petigara, Ramesh B.: *See—*
Bayer, Horst O.; Lange, Barry C.; and Petigara, Ramesh B., 5,068,338, Cl. 548-101.000.

Petio, Franz A.: *See—*
Lepoutre, Etienne; Devaux, Michel; Hirschberg, Bruno; Petio, Franz A.; and Weitzer, Paul, 5,067,693, Cl. 266-44.000.

Petit, Francis: *See—*
Brusson, Jean M.; Bujadoux, Karel; Petit, Francis; Fuchs, Jean M.; and Mortreux, Andre , 5,068,014, Cl. 204-59.00M.

Petroleo Brasileiro S.A. - Petrobras: *See—*
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

Petrushka, Robert G., to LTV Steel Company, Inc. Shrouding for top pouring of ingots. 5,067,552, Cl. 164-259.000.

Petty, Stephen E.: *See—*
Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., 5,067,330, Cl. 62-485.000.

Pews, R. Garth: *See—*
Puckett, Wallace E.; and Pews, R. Garth, 5,068,347, Cl. 548-263.800.

Pezant, Christian: *See—*
Falp, Benoit; and Pezant, Christian, 5,068,522, Cl. 250-206.100.

Pfeiffer, Pierre; Cheval, Benoit; and Sigwalt, Paul, to Sotralentz S. A. Container assembly for the transport, storage and dispensing of flowable materials. 5,067,636, Cl. 222-105.000.

Pfizer Inc.: *See—*
Murtiashaw, Charles W.; and Quallich, George J., 5,068,333, Cl. 546-116.000.

Phalon, Philip A., Jr.; Caramiciu, Marius A.; and DiGiovanni, Robert C., to Raytheon Company. Complaint hot bar apparatus. 5,068,508, Cl. 219-85.160.

Philip Morris Incorporated: *See—*
Brookman, Donald L.; Grollimund, Everett C.; Grollimund, Gary E.; and Spiers, Steven F., 5,067,303, Cl. 53-381.200.
Keritsis, Gus D., 5,067,500, Cl. 131-335.000.
Wheless, Jack C.; Keen, Billy J., Jr.; and Ritt, Renzer R., Sr., 5,067,498, Cl. 131-88.000.

Phillips, Don: *See—*
Hurnik, Frank; Jarmain, Eric; Phillips, Don; Kirkland, Michael; Harkes, Douglas; and Gordon, Donald J., 5,067,443, Cl. 119-71.000.

Phillips Petroleum Company: *See—*
Efner, Howard F., 5,068,274, Cl. 524-230.000.
Lee, Fu-Ming; and Brown, Ronald E., 5,068,011, Cl. 203-58.000.

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Lee, Clifford C.; and Welch, M. Bruce, 5,068,212, Cl. 502-105.000.

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Potvin, Robert E.: *See—*
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Niewold, D. Wayne; and Bradley, Richard A., 5,067,571, Cl. 175-394.000.

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Watterson, Scott R.; Bersonnet, George B.; Dalebout, William T.; and Burk, Michael, 5,067,710, Cl. 272-129.000.

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Hilbrands, Martin J., 5,067,285, Cl. 51-426.000.

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Schlatter, Howard M.; and Wisne, Lawrence A., 5,067,606, Cl. 198-465.100.

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Corle, Timothy R.; Mallory, Chester L.; and Wasserman, Philip D., 5,067,805, Cl. 359-235.000.

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Pullen, Antoinette D., Legal Representative: *See*—
Nicklas, James R.; Bright, Gerald; Pullen, Eric V., deceased; and Nicklas, James R., 5,067,513, Cl. 137-98.000.

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Zylka, Karl H.; and Buckley, Augustus M., Jr., 5,067,865, Cl. 411-531.000.

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Kosmyna, Michael J., 5,067,518, Cl. 137-588.000.

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Rast, James P. Method and apparatus for lining the interior surface of a high temperature chamber with heat insulation material. 5,067,420, Cl. 110-336.000.

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Schroter, John C., 5,068,872, Cl. 375-1.000.
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Herent, Gerard; Mahe, Michel; and Romagny, Alex, 5,068,584, Cl. 318-549.000.

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Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; Law, Robert W.; and Vincent, Michael T., to Barrack Technology Limited. Method and apparatus for operating an engine. 5,067,463, Cl. 123-425.000.

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Gubelmann, Michel; Rochin, Christophe; and Allandrieu, Christian, 5,068,391, Cl. 560-25.000.
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Riccioni, Giovanna: *See—*
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Rich Ideas, Inc.: *See—*
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Richard, Fred V.: *See—*
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Richer, Raymond P. Planter. 5,067,286, Cl. 52-27.000.

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Ricoh Company, Ltd.: *See—*
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 5,068,350, Cl. 548-444.000.
Hiroe, Akihiko, 5,068,526, Cl. 250-214.00R.
Suzuki, Takumi; and Uehara, Kiyohiro, 5,067,796, Cl. 359-88.000.
Tsuji, Takahiro, 5,068,540, Cl. 250-561.000.
Yoshida, Yoshiki; and Asada, Kenichirou, 5,068,676, Cl. 346-108.000.

Rideout, Janet L.: *See—*
Koszalka, George W.; Burns, Charlene L.; Krenitsky, Thomas A.; and Rideout, Janet L., 5,068,320, Cl. 536-24.000.

Ridgway, Richard W.: *See—*
Klopfleisch, Kim A.; Wellman, Tim A.; Kaiser, Willard D.; Koenig, Mark J.; Ridgway, Richard W.; Walters, Bobby L.; and Zelinski, Matthew S., 5,068,791, Cl. 364-424.020.

Ridings, Henry T.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 5,067,499, Cl. 131-194.000.

Riedisser, Gunter: *See—*
Rahn, Oskar; and Riedisser, Gunter, 5,067,892, Cl. 425-556.000.

Riegel, Ulrich: *See—*
Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, 5,068,298, Cl. 526-240.000.

Riello, Christopher S.: *See—*
Baker, Walter J.; and Riello, Christopher S., 5,067,305, Cl. 53-411.000.

Rienmueller, Rainer; Kalender, Willi; and Seissler, Wolfgang, to Siemens Aktiengesellschaft. Device for generating trigger signals for a medical apparatus dependent on the respiratory activity of a patient. 5,067,494, Cl. 128-653.100.

Riggin, Ralph M.: *See—*
Becker, Gerald W.; and Riggin, Ralph M., 5,068,317, Cl. 530-399.000.

Rim, Peter B.: *See—*
Nelson, Charles J.; Bheda, Jayendra H.; Rim, Peter B.; and Turner, James M., 5,067,538, Cl. 152-451.000.

Rinkavage, Raymond M. Method of playing a poker game. 5,067,724, Cl. 273-292.000.

Ritchey, Albert E.; and Reeves, Thomas C. Protective headgear. 5,067,174, Cl. 2-10.000.

Ritt, Renzer R., Sr.: *See—*
Wheless, Jack C.; Keen, Billy J., Jr.; and Ritt, Renzer R., Sr., 5,067,498, Cl. 131-88.000.

Ritter, Joachim; and Hochmuth, Harald, to INA Walzlager Schaeffler KG. Load-switching overrunning clutch. 5,067,598, Cl. 192-7.000.

Ritzer, Edwin: *See—*
Diehl, Herbert; Blank, Heinz U.; and Ritzer, Edwin, 5,068,428, Cl. 564-134.000.

Rivinius, Helmut: *See—*
Klingler, Otto; Gruhler, Siegfried; and Rivinius, Helmut, 5,068,653, Cl. 340-870.370.

Rix, David M.; Long, Martin W.; Lee, Thomas R.; and Dawes, Douglas E., to Cummins Engine Company, Inc. Fuel injector for an internal combustion engine. 5,067,464, Cl. 123-446.000.

Rizk, Reda: *See—*
Finsterwalder, Gerhard; Rizk, Reda; and Michels, Hans G., 5,067,880, Cl. 417-495.000.

Robb, Jenifer L., to Tioxide Group PLC. Aqueous dispersions of acicular titanium dioxide. 5,068,056, Cl. 252-313.100.

Robbins, John A.; Zarian, Jamshid J.; and Willford, Sandford R., to Lumenyte International Corporation. Linear optical conduits. 5,067,831, Cl. 385-123.000.

Robbins, John D.: *See—*
Fernandez, Antonio; Gaggioni, Hugo P.; Jaquez, Martin J.; Robbins, John D.; and Soper, E. Scott, 5,068,650, Cl. 340-799.000.

Robert Bosch GmbH: *See—*
Burger, Wilfried; Nitschke, Werner; Taufer, Peter; and Weller, Hugo, 5,068,640, Cl. 340-438.000.
Condne, Claus; Mattes, Bernhard; and Schmalz, Dieter, 5,068,793, Cl. 364-424.050.
Conzelmann, Gerhard; Haack, Dietmar; and Fiedler, Gerhard, 5,068,703, Cl. 357-36.000.
Joachim, Ernst-Ulrich; and Kull, Hermann, 5,067,461, Cl. 123-357.000.
Seipler, Dieter, 5,068,714, Cl. 357-80.000.

Roberts, William O.: *See—*
Cole, James A.; Roberts, William O.; and Turgeon, Joseph T., 5,068,134, Cl. 427-376.200.

Robertshaw Controls Company: *See—*
Genbauffe, Francis S., 5,067,651, Cl. 236-15.00A.

Robinett, Scott: *See—*
Buford, Thomas B., III; Brosnahan, Robert; Robinett, Scott; and Clark, James, 5,067,956, Cl. 606-73.000.

Robinson, Jeffrey I., to Star Semiconductor Corporation. Programmable integrated circuit using topological and parametric data to selectively connect and configure different high level functional blocks thereof. 5,068,823, Cl. 395-500.000.

Robles, Jerry: *See—*
Nichols, Robert N., 5,067,944, Cl. 604-192.000.

Robur Maskin AB: *See—*
Andersson, Morgan, 5,067,421, Cl. 111-36.000.

Rochin, Christophe: *See—*
Crochemore, Michel; and Rochin, Christophe, 5,068,450, Cl. 568-435.000.
Gubelmann, Michel; Rochin, Christophe; and Allandrieu, Christian, 5,068,391, Cl. 560-25.000.

Rockwell International Corporation: *See—*
Culp, Gordon W., 5,068,566, Cl. 310-328.000.
Sullivan, Gerard J.; Pedrotti, Kenneth D.; and Kroemer, Herbert, 5,067,828, Cl. 385-3.000.
Sutherland, Dennis W., 5,068,656, Cl. 340-989.000.
Szabo, Steve B.; and Chien, Daniel G., 5,067,732, Cl. 277-11.000.

Rode, Walter H. Spillproof oil well seal. 5,067,563, Cl. 166-84.000.

Roder, Manfred; and Konrad, Andreas, to Fichtel & Sachs AG. Arrangement for controlling a motor friction clutch. 5,067,599, Cl. 192-0.320.

Rodewald, Paul G.: *See—*
Chen, Catherine S. H.; and Rodewald, Paul G., 5,068,048, Cl. 252-52.00A.

Rodgers, Juliana: *See—*
Falk, Robert A.; Clark, Kirkland P.; Jacobson, Michael; Karydas, Athanasios; and Rodgers, Juliana, 5,068,397, Cl. 560-150.000.

Rodriques, Karen E.: *See—*
Brooks, Dee W.; and Rodriques, Karen E., 5,068,251, Cl. 514-506.000.

Roehl, Franz: *See—*
Zipplies, Matthias; Sauter, Hubert; Roehl, Franz; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 5,068,245, Cl. 514-429.000.

Rogers, John E. Seat cushions and body supports, and fitting instruments for the same. 5,068,504, Cl. 200-85.00R.

Rogers, Russell L.: *See—*
Maiville, Randolph L.; and Rogers, Russell L., 5,067,752, Cl. 285-119.000.

Rogers, Stephen P.; and Lebby, Michael S., to Motorola, Inc. Etching of materials in a noncorrosive environment. 5,068,007, Cl. 156-643.000.

Rohm Co., Ltd.: *See—*
Kurita, Yoshio; and Akamatsu, Akira, 5,068,206, Cl. 437-220.000.

Nakamura, Nobuyuki; Sakamoto, Yuji; Kawakami, Takashi; and Ohkubo, Shinya, 5,067,229, Cl. 29-566.100.

Rohm and Haas Company: *See*—
Bayer, Horst O.; Lange, Barry C.; and Petigara, Ramesh B., 5,068,338, Cl. 548-101.000.
Petigara, Ramesh B.; Leister, Norman A.; Pendell, Barry J.; and Woodruff, Robert A., 5,068,344, Cl. 548-213.000.

Roley, George: *See*—
Schossig, Juergen; Koppenhoffer, Gerhard; Irgang, Matthias; Schnur, Rudi; and Roley, George, 5,068,468, Cl. 568-861.000.

Rolfe, Gary, to Lawrence, Neil. Resettable sandglass-type timing device which provides selective timing periods. 5,068,839, Cl. 368-93.000.

Rollerblade, Inc.: *See*—
Olson, Brennan J.; and Brace, Thomas J., 5,067,736, Cl. 280-11.200.

Rolls-Royce plc: *See*—
Reynolds, Graham A., 5,067,387, Cl. 89-8.000.

Rolscreen Company: *See*—
Hagemeyer, Bruce A., 5,067,279, Cl. 49-471.000.

Romagny, Alex: *See*—
Herent, Gerard; Mahe, Michel; and Romagny, Alex, 5,068,584, Cl. 318-549.000.

Ronzoni, Enrico, to Gildemeister Italiana S.p.A. Clamping device for locking the workpiece-carrying collet in automatic machine tools. 5,067,735, Cl. 279-1.00F.

Roosen, Johannes H. J.: *See*—
de Vrieze, Henricus M.; Roosen, Johannes H. J.; and Vriens, Leendert, 5,068,568, Cl. 313-474.000.

Rosa, John, to Westinghouse Electric Corp. 24-pulse hexagon-type AC/DC static converter. 5,068,774, Cl. 363-3.000.

Rose, Burkhard: *See*—
Tennigkeit, Jurgen; and Rose, Burkhard, 5,068,102, Cl. 424-72.000.

Rosen, Samuel R.: *See*—
DeVries, James E.; Rosen, Samuel R.; and Schneider, Robert D., 5,067,882, Cl. 417-511.000.

Rosen, Warren A.: *See*—
Kline, Todd A.; Rosen, Warren A.; Bermingham, William J.; and Alfonsi, Eric A., 5,068,880, Cl. 375-116.000.

Rosenfeld, Anne; and Barkman, Frank. Sanitary device. 5,067,194, Cl. 15-144.00A.

Rosenthal, Robert D., to Futrex, Inc. Method for providing custom calibration for near infrared instruments for measurement of blood glucose. 5,068,536, Cl. 250-341.000.

Roskowiak, Robert W.: *See*—
Chanen, Michael J.; and Roskowiak, Robert W., 5,068,114, Cl. 426-69.000.

Ross Operating Valve Company: *See*—
Russell, Neil E.; and Libby, Owen H., 5,067,519, Cl. 137-596.140.

Roth, Josef, to Karl Mayer Textilmaschinenfabrik GmbH. Guide bar bearing for warp knitting machines. 5,067,332, Cl. 66-207.000.

Roti, Joseph S.: *See*—
Go, Winston S.; Roti, Joseph S.; Lang, Mark G.; and Weiss, Charles O., 5,068,059, Cl. 252-389.530.

Roukema, Mees: *See*—
Pennings, Albert J.; and Roukema, Mees, 5,068,073, Cl. 264-205.000.

Roussel Uclaf: *See*—
Bonit, Marc; and Demoute, Jean-Pierre, 5,068,229, Cl. 514-114.000.
Moura, Anne-Marie; Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 5,068,244, Cl. 514-428.000.

Rowe International, Inc.: *See*—
Dekker, Donald A., 5,067,701, Cl. 271-7.000.

Rowe, Ransom, to K&R Manufacturing, Inc. Drive adapter for firearm cartridge reloader. 5,067,383, Cl. 86-23.000.

Roy, Aroop K., to Dow Corning Corporation. Method for preparing sulfonimidoyl halides. 5,068,379, Cl. 556-422.000.

Royal Institution for the Advancement of Learning (McGill University), The: *See*—
Hunter, Ian W., 5,067,509, Cl. 137-14.000.

Rubertone, Joseph A.: *See*—
Schweighardt, Frank K.; and Rubertone, Joseph A., 5,068,098, Cl. 424-9.000.

Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., to Yellow Freight System, Inc. Conveyor for mixed freight handling system. 5,067,867, Cl. 414-391.000.

Ruebsam, Klemens: *See*—
Heinz, Jochen; Krug, Thomas; Ruebsam, Klemens; and Kessler, Hans, 5,068,915, Cl. 392-389.000.

Ruf, Erich, to Th. Goldschmidt AG. Method for the preparation of anhydrous tin-(IV)-carboxylates. 5,068,373, Cl. 556-105.000.

Ruf, Erich, to T. Goldschmidt AG. Method for the preparation of anhydrous tin-dicarboxylate-dihalides. 5,068,374, Cl. 556-105.000.

Ruf, Reinhold: *See*—
Aschaber, Hans; Bailer, Rudolf; Fochler, Fritz; Kleinstauber, Bernd; and Ruf, Reinhold, 5,067,937, Cl. 493-310.000.

Ruger, Wolfgang: *See*—
Nickel, Wolf-Ulrich; Ruger, Wolfgang; Urbach, Hansjorg; and Hock, Franz, 5,068,242, Cl. 514-412.000.

Ruppen, Mark E.; and Hagedorn, Scott, to Celgene Corporation. Hydroxyterephthalic acid. 5,068,414, Cl. 562-508.000.

Rupprecht, Kathleen M.: *See*—
Tischler, Allan N.; Durette, Philippe L.; Witzel, Bruce E.; Rupprecht, Kathleen M.; Gallagher, Timothy F.; Goldenberg, Marvin M.; and Allison, Debra L., 5,068,248, Cl. 514-443.000.

Russeler, Wolfgang: *See*—
Dorf, Ernst-Ulrich; Russeler, Wolfgang; Kohler, Burkhard; Ebert, Wolfgang; and Schmitt, Walter, 5,068,312, Cl. 528-388.000.

Russell, Neil E.; and Libby, Owen H., to Ross Operating Valve Company. Safety valve for fluid systems. 5,067,519, Cl. 137-596.140.

Rutherford, Hal; and Taub, Floyd, to Applied Imaging Corporation. Method and apparatus for generating quantifiable video displays. 5,068,909, Cl. 382-49.000.

Ryan, Dana W.; Kaiser, James M.; and Hinsch, Robert M., to Ryan Medical, Inc. Safety needled medical devices capable of one-handed manipulation. 5,067,945, Cl. 604-198.000.

Ryan Medical, Inc.: *See*—
Ryan, Dana W.; Kaiser, James M.; and Hinsch, Robert M., 5,067,945, Cl. 604-198.000.

Ryan, Timothy R.: *See*—
Lindley, Daniel D.; Curtis, Thomas A.; Ryan, Timothy R.; de la Garza, Edward M.; Hilton, Charles B.; and Kenesson, Thomas M., 5,068,448, Cl. 568-319.000.

Rypka, Dann B., to Owatonna Tool Company. Automatic coupling system. 5,067,694, Cl. 269-20.000.

S. C. Johnson & Son, Inc.: *See*—
Sramek, John A., 5,068,099, Cl. 424-47.000.

Saeki, Junichi: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Saeki, Toshiro, to Seikosha Co., Ltd. IC holder. 5,067,911, Cl. 439-526.000.

Safe T.V., Inc.: *See*—
Herlitz, Nils G.; Iglehart, Karl I.; and Sentell, John S., 5,068,720, Cl. 358-100.000.

Sagawa, Tetsuya, to AMP Incorporated. Electrical connector. 5,067,913, Cl. 439-595.000.

Sahai, Om P.: *See*—
Knuth, Mark E.; and Sahai, Om P., 5,068,184, Cl. 435-41.000.

St. Angelo, Stephen, Jr.; Lucci, John J.; Carver, George C.; Heads, Alan; and Mitchell, James F., to General Motors Corporation. Method of a robot for installing weather stripping in a door or like opening. 5,067,225, Cl. 29-451.000.

St. Germain, Gene R., to Caterpillar Inc. Load check and pressure compensating valve. 5,067,389, Cl. 91-446.000.

St. John, Michael R.: *See*—
Bhattacharyya, Bhupati R.; and St. John, Michael R., 5,068,297, Cl. 526-287.000.

St. Phillips, Eric A.: *See*—
Grosz, Edward G.; Herrington, Fox J.; and St. Phillips, Eric A., 5,067,633, Cl. 221-279.000.
Herrington, F. John, Jr.; and St. Phillips, Eric A., 5,067,208, Cl. 24-400.000.

Saito, Keikichi: *See*—
Uchida, Tadahiro; Shimamura, Kuniyuki; Nogawa, Hayabu; Saito, Keikichi; and Hara, Minoru, 5,067,938, Cl. 494-12.000.

Saito, Mitsuo: *See*—
Tanaka, Masakatsu; Itoh, Masanobu; Arabori, Noboru; Nara, Toshihiko; Takahashi, Tastuhiko; Masuda, Katutaro; and Saito, Mitsuo, 5,067,593, Cl. 187-73.000.

Saito, Shigeru: *See*—
Fukada, Eiichi; Saito, Shigeru; Yagi, Toshiharu; and Higashihata, Yoshihide, 5,067,488, Cl. 128-777.000.

Saitou, Tetuji: *See*—
Yoshida, Yzo; Saitou, Tetuji; and Momose, Yoshiaki, 5,068,136, Cl. 428-35.700.

Sajtos, Alexander; Kloimstein, Engelbert; Hollinger, Karl; and Farnlettner, Lorenz, to Chemie Linz Gesellschaft m.b.H. Process for the continuous preparation of glyoxylic acid. 5,068,417, Cl. 562-577.000.

Sakagawa, Kazuo: *See*—
Nojima, Satoshi; Sakagawa, Kazuo; and Suzuki, Hideo, 5,068,820, Cl. 395-275.000.

Sakaguchi, Takashi, to Kabushiki Kaisha Toshiba. Delta-sigma modulation analog to digital converter. 5,068,659, Cl. 341-143.000.

Sakai, Ichiro; Arai, Yasuhisa; Yamamoto, Masataka; and Matsui, Hiroki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle automatic transmission control system. 5,067,374, Cl. 74-866.000.

Sakai, Isoji: *See*—
Yokokura, Hisao; Nakada, Tadao; Kitamura, Teruo; Mukoh, Akio; Kando, Yasuhiko; Sakai, Isoji; Fujimura, Yasuo; Masutani, Noboru; Matsumoto, Tsunetaka; and Imanishi, Yasuo, 5,067,797, Cl. 359-76.000.

Sakai, Takayuki: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 5,068,350, Cl. 548-444.000.

Sakamoto, Kiichiro: *See*—
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 5,068,742, Cl. 358-296.000.

Sakamoto, Yuji: *See*—
Nakamura, Nobuyuki; Sakamoto, Yuji; Kawakami, Takashi; and Ohkubo, Shinya, 5,067,229, Cl. 29-566.100.

Sakashita, Katsuaki: *See*—
Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 5,068,282, Cl. 525-61.000.
Sakashita, Takeshi: *See*—
Tanaka, Masahide; Agou, Tokinori; Kuwahara, Masahiro; Sakashita, Takeshi; Shimoda, Tomoaki; and Sudou, Masaru, 5,068,400, Cl. 560-223.000.
Sakayori, Akio: *See*—
Tsuihiji, Yutaka; and Sakayori, Akio, 5,067,704, Cl. 271-262.000.
Sakuma, Kouichi, to Suzuki Manufacturing Co., Ltd. Buttonhole sewing machine. 5,067,422, Cl. 112-68.000.
Sakura Finetechnical Co., Ltd.: *See*—
Toya, Matsumi, 5,068,091, Cl. 422-99.000.
Sakurada, Koichi: *See*—
Ueda, Makoto; Sakurada, Koichi; Sakurai, Shungo; Yoshioka, Ritsuo; Ogiya, Shunsuke; and Nagano, Mamoru, 5,068,082, Cl. 376-428.000.
Sakurai, Keiichi: *See*—
Nakahara, Kei; Sakurai, Keiichi; Okamura, Toshihiko; Yoshimura, Hironori; Eto, Hiroyuki; and Kikuchi, Noribumi, 5,068,148, Cl. 428-335.000.
Sakurai, Shoji: *See*—
Imanaka, Tadayuki; and Sakurai, Shoji, 5,068,194, Cl. 435-252.500.
Sakurai, Shungo: *See*—
Ueda, Makoto; Sakurada, Koichi; Sakurai, Shungo; Yoshioka, Ritsuo; Ogiya, Shunsuke; and Nagano, Mamoru, 5,068,082, Cl. 376-428.000.
Salaba, Timothy A.; and Wilfong, Debra L., to Minnesota Mining and Manufacturing Company. Reaction injection molding machine. 5,067,886, Cl. 425-145.000.
Salhi, Ali: *See*—
Proietto, Vincenzo; and Salhi, Ali, 5,068,064, Cl. 260-404.500.
Samejima, Masayoshi; Noda, Kazuo; Hirakawa, Yoshiyuki; and Yoshino, Hiroyuki, to Tanabe Seiyaku Co., Ltd. Controlled release pharmaceutical preparation and method for producing the same. 5,068,112, Cl. 424-495.000.
Samsung Electron Devices Co., Ltd.: *See*—
Won, Song, 5,068,157, Cl. 428-690.000.
Samsung Electronics Co., Ltd.: *See*—
Chang, Kyujeong, 5,068,699, Cl. 357-23.700.
Choi, Kwang-Moon, 5,068,758, Cl. 360-96.600.
Kang, Laegu; and Kim, Kyungtae, 5,068,200, Cl. 437-52.000.
Ki-Joon, Kim, 5,068,516, Cl. 219-388.000.
Oh, Tae S., 5,067,473, Cl. 126-113.000.
San Andres, Luis A.: *See*—
Vance, John M.; and San Andres, Luis A., 5,067,825, Cl. 384-99.000.
Sanden Corporation: *See*—
Ishii, Yutaka, 5,067,562, Cl. 165-146.000.
Sanderson, John R.; and Marquis, Edward T., to Texaco Chemical Company. Simultaneous epoxide and carboxylic acid manufacture by co-oxidation in the presence of a cobalt catalyst. 5,068,366, Cl. 549-533.000.
Sanderson, Neil E.: *See*—
Bradshaw, Neil; and Sanderson, Neil E., 5,068,534, Cl. 250-288.000.
Sandhaus, Jeffrey J., to Population Counsil, Inc., The. Apparatus for effecting occlusion of target vessels or tissue. 5,067,958, Cl. 606-142.000.
Sandhu, Gurtej S., to Micron Technology, Inc. Method for anodizing a polysilicon layer lower capacitor plate of a DRAM to increase capacitance. 5,068,199, Cl. 437-52.000.
Sandler, Stanley R.; Schon, Steven G.; and Gardner, David M., to Atochem North America, Inc. Process for the preparation of alkane- and arenesulfonamides. 5,068,427, Cl. 564-84.000.
Sanford, Edward L.: *See*—
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Sankyo Company, Limited: *See*—
Nakamura, Norio; Koike, Hiroyuki; and Oshima, Takeshi, 5,068,340, Cl. 548-119.000.
Sannohe, Kanetaro: *See*—
Nakamura, Yoshinobu; Sannohe, Kanetaro; Sohama, Yoshio; Iwasaki, Toru; and Yamano, Sumiko, 5,068,150, Cl. 428-407.000.
Sano, Yoshiyuki: *See*—
Takagaki, Hidetsugu; Nakanishi, Shigenori; Abe, Masayoshi; Ohki, Hiromi; and Sano, Yoshiyuki, 5,068,364, Cl. 549-415.000.
Sanofi: *See*—
Proietto, Vincenzo; and Salhi, Ali, 5,068,064, Cl. 260-404.500.
Sanshin Industries Co., Ltd.: *See*—
Nakase, Ryoichi; and Mineo, Shigeharu, 5,067,448, Cl. 123-41.310.
Okita, Ryozo, 5,067,919, Cl. 440-61.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Takashima, Kazutoshi, 5,067,453, Cl. 123-193.00P.
Sansone, Ronald P.; and Schumacher, Karl H., to Pitney Bowes Inc. Optimizing mail delivery systems by routing. 5,068,797, Cl. 364-478.000.
Santangelo, John, to Codman & Shurtleff, Inc. Low wear bearing for a surgical retractor. 5,067,477, Cl. 128-20.000.
Santel, Hans-Joachim: *See*—
Andree, Roland; Haug, Michael; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,068,394, Cl. 560-56.000.
Santos, Luiz D.: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.
Sanwa Diamond Industrial Co., Ltd.: *See*—
Matsuda, Yusaku, 5,067,969, Cl. 51-293.000.
Sanyo Electric Co., Ltd.: *See*—
—Ishiguro, Kazuhisa; and Sekiguchi, Yutaka, 5,068,544, Cl. 307-268.000.
—Nagasawa, Naobumi; and Arai, Hiroyuki, 5,068,856, Cl. 371-37.500.
Saratoga Spa & Bath Co.: *See*—
Gardenier, John, 5,067,228, Cl. 29-525.100.
Sarcos Group: *See*—
Jacobsen, Stephen C.; Iversen, Edwin K.; Knutti, David F.; and Davis, Clark C., 5,067,512, Cl. 137-83.000.
Saringer, John; and Galbreath, Andrew, to Toronto Medical Corp. Continuous passive motion device. 5,067,479, Cl. 128-26.000.
Sasa, Nobumasa; Shimizu, Kunio; and Watanabe, Manabu, to Konica Corporation. Method for transferring images and an apparatus used therefor. 5,068,689, Cl. 355-107.000.
Sasaki, Makoto; Takatsu, Haruyoshi; and Takeuchi, Kiyofumi, to Dainippon Ink and Chemicals, Inc. Fluorine-substituted compound containing ether bond and intermediate thereof. 5,068,462, Cl. 568-661.000.
Sasaki, Masaomi: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 5,068,350, Cl. 548-444.000.
Sasaki, Shigeo: *See*—
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Sato, Kazuhiko, to Diesel Kili Co., Ltd. Differential gear mechanism. 5,067,934, Cl. 475-227.000.
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Sato, Shinichi, to Fujitsu Limited. Signal processing circuit of a bar code reader. 5,068,520, Cl. 235-462.000.
Sato, Yoshihiro: *See*—
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Satoh, Atsushi: *See*—
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Satoh, Yutaka, to Hitachi, Ltd. Video display apparatus. 5,068,732, Cl. 358-180.000.
Sauer, Joe D.: *See*—
Borland, James E.; Chen, Y.-D. Mark; Sauer, Joe D.; Smith, Kim R.; and Smith, Rebecca F., 5,068,430, Cl. 564-298.000.
Sauk Valley Equipment Company: *See*—
King, James L., Sr.; King, James L., Jr.; and Pope, John, 5,067,590, Cl. 184-15.100.
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Sauter, Hubert: *See*—
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Grell, Wolfgang; Hurnaus, Rudolf; Reiffen, Manfred; Sauter, Robert; Pichler, Ludwig; Kobinger, Walter; Entzeroth, Michael; Mierau, Joachim; and Schingnitz, Gunter, 5,068,325, Cl. 514-215.000.
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Savage, John M., Jr. Reflector lens cap and/or clip for LED. 5,068,771, Cl. 362-255.000.
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Zlobinsky, Yury; and Mattes, Donald A., 5,067,251, Cl. 34-5.000.
Savelainen, Matti, to Instrumentarium Corp. Measuring procedure for the elimination of faults from an NMR signal by comparing RF field components spinning in opposite directions. 5,068,611, Cl. 324-314.000.

Savrun, Ender: *See—*
Giunchi, Giovanni; Savrun, Ender; Grenni, Alberto; and Chen, Ching-Fong, 5,068,211, Cl. 501-98.000.
Sawa, Takao; and Okamura, Masami, to Kabushiki Kaisha Toshiba. Fe-based soft magnetic alloy. 5,067,991, Cl. 148-305.000.
Sawada, Hideo; and Nakayama, Masaharu, to Nippon Oil & Fats Co., Ltd. Polyfluoroalkanoyl peroxide. 5,068,454, Cl. 568-566.000.
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Scala, Eraldus, to Cortland Cable Company, Inc. Braider method and apparatus for manufactured faired rope or cable. 5,067,384, Cl. 87-6.000.
Scapa, Inc.: *See—*
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Schaap, Arthur P.; and Akhavan-Jaffi, Hashem, to Board of Governors of Wayne State University. Enhanced chemiluminescence from 1,2-dioxetanes through energy transfer to tethered fluorescers. 5,068,339, Cl. 548-110.000.
Schaefer, Fritz P.; Szatmari, Sandor; and Jethwa, Jaydev, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Apparatus for measuring the duration of single optical radiation pulses. 5,068,525, Cl. 250-213.0VT.
Schaefer, George F.: *See—*
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Scherk, Randall P.; and Steneker, Daniel J., to AFD Systems, Inc. Interactive facsimile information retrieval system and method. 5,068,888, Cl. 379-100.000.
Scheuneman, James H.; and Fontaine, Lawrence R., to Unisys Corp. Accessing control with predetermined priority based on a feedback arrangement. 5,068,782, Cl. 395-425.000.
Schiessl, Henry W., to Olin Corporation. Process for minimizing residual free hydrazine in polymer latices. 5,068,313, Cl. 528-483.000.
Schildknecht, Manfred; and Honcia, Gunter, to Battelle Institut e.V. Shaped charge for combating armored targets. 5,067,409, Cl. 102-476.000.
Schilling, Harold D. Forage feeding device. 5,067,442, Cl. 119-60.000.
Schiltmans, Ronald P. A.: *See—*
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Schissel, David N.; and Haitko, Deborah A., to General Electric Company. Bisimidodiphenol derivatives. 5,068,352, Cl. 548-461.000.
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Schlatter, Howard M.; and Wisne, Lawrence A., to Progressive Tool & Industries Co. Clamp actuating system for a conveyor carried clamping frame. 5,067,606, Cl. 198-465.100.
Schlingmann, Merten; Keller, Reinhold; Wiesner, Matthias; Treder, Wolfgang; and Thiem, Joachim, to Hoechst Aktiengesellschaft. Process for the enzymatic preparation of disaccharide fluorides using α-glycosyl fluorides as substrates. 5,068,186, Cl. 435-96.000.
Schlueter, Charles. Clamp-hub. 5,067,845, Cl. 403-344.000.
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Schmidhammer, Ludwig; Haselwarter, Klaus; Klaus, Hermann; and Mohr, Klaus-Peter, to Wacker-Chemie GmbH. Process for purifying unreacted 1,2-dichloroethane from a 1,2-dichloroethane pyrolysis process. 5,068,475, Cl. 570-262.000.
Schmidt, Axel; Von Der Eltz, Herbert; and Rauscher, Elli, to Boehringer Mannheim GmbH. Substrates and reagents useful in determining α-amylase and a method for determining α-amylase. 5,068,182, Cl. 435-22.000.
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Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., to Callaway Golf Company. Hollow, metallic golf club head with dendritic structure. 5,067,715, Cl. 273-167.00F.
Schmidt, Robert R.: *See—*
Andree, Roland; Haug, Michael; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,068,394, Cl. 560-56.000.
Schmitt, Eugene W., to Sloan Valve Company. Air brake system for an articulated railroad car. 5,067,777, Cl. 303-22.600.
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Schroter, John C., to Raytheon Company. Apparatus and method for short cycling sequences of a p-code generator. 5,068,872, Cl. 375-1.000.
Schubert, Erdmann F.: *See—*
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Schuster, Rudolf, to Siemens Aktiengesellschaft. Soldering means which has at least one stirrup electrode which can be heated by electrical resistance. 5,068,510, Cl. 219-85.160.
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Schwartz, William K. Method for dispensing drinking straws and a supply arrangement therefor. 5,067,629, Cl. 221-70.000.
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Schwarzbauer, Herbert, to Siemens Aktiengesellschaft. Apparatus for fastening semiconductor components to substrates. 5,067,647, Cl. 228-5.500.
Schweighardt, Frank K.; and Rubertone, Joseph A., to Air Products and Chemicals, Inc. Perfluoro-crown ethers in fluorine magnetic resonance spectroscopy. 5,068,098, Cl. 424-9.000.
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Scientific Atlanta, Inc.: *See—*
West, Lamar E.; Lafay, William P.; Ghanouni, Majid; and Cook, Alex M., Jr., 5,068,893, Cl. 380-7.000.
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Scosche Industries, Inc.: *See—*
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Scott, Mary Ellen A.: *See—*
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Scragg, Carl: *See—*
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SDS Biotech K.K.: *See—*
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Seagate Technology, Inc.: *See—*
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Sealright Co., Inc.: *See—*
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Searcy, Gus; and Kavan, Franz. Voice recognition system. 5,068,900, Cl. 381-43.000.

Sears, Martin D.: *See—*
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Seefeldt, Joachim, to bielomatik Leuze GmbH & Co. Cutting mechanism for materials in web or layer form. 5,067,380, Cl. 83-481.000.

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Sefko, John: *See—*
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Seidel, Peter; and Zell, Karl, to Siemens Aktiengesellschaft. Method for contacting shielding plates. 5,067,232, Cl. 29-837.000.

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Seidel, Winfried: *See—*
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Seidensha Electronics Co., Ltd.: *See—*
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Seikagaku Kogyo Co. Ltd.: *See—*
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Seiko Epson Corporation: *See—*
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Seikosha Co., Ltd.: *See—*
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Seipler, Dieter, to Robert Bosch GmbH. Method of electrically and mechanically connecting a semiconductor to a substrate using an electrically conductive tacky adhesive and the device so made. 5,068,714, Cl. 357-80.000.

Seissler, Wolfgang: *See—*
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Sekino, Hitoshi: *See—*
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Semet, Christian: *See—*
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Semons, William. Zipper attachment assembly. 5,067,207, Cl. 24-381.000.

Senatore, Daniele, to Gianni Bulgari S.p.A. Adjustable transparency spectacles. 5,067,795, Cl. 359-84.000.

Sendelweck, Gene K., to Thomson Consumer Electronics, Inc. Video control circuit. 5,068,730, Cl. 358-169.000.

Sensabaugh, Andrew J., Jr.: *See—*
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Horlacher, Peter; Serini, Volker; Freitag, Dieter; Grigo, Ulrich; Idel, Karsten-Josef; and Westeppe, Uwe, 5,068,302, Cl. 528-21.000.

Sersen, Stanley J. Roof sheathing test system. 5,067,353, Cl. 73-849.000.

Seto, Nobuo; Morigaki, Masakazu; and Naruse, Hideaki, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 5,068,172, Cl. 430-551.000.

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Sexton, Daniel W.; and Bentley, William F., to GE Fanuc Automation North America, Inc. Bit processor with powers flow register switches control a function block processor for execution of the current command. 5,068,821, Cl. 395-800.000.

Sfarzetta, Mario: *See—*
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SGS-Thomson Microelectronics S.r.l.: *See—*
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SGS-Thomson Mocroelectronics S.r.l.: *See—*
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Shaffer, Timothy D., to General Electric Co. Polyphenylene ether process, catalyst and resin composition. 5,068,310, Cl. 528-215.000.

Shannon, Michael D.: *See—*
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Shapiro, Ascher H., to Bird Machine Company. Conveyorless clarifier. 5,067,939, Cl. 494-53.000.

Shapiro, James; and Zakrzewski, Bogdan, to Troy Lighting, Inc. Recessed lighting fixture. 5,068,772, Cl. 362-365.000.

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Paige, Clive R., 5,067,654, Cl. 239-124.000.

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Barre, Claude, 5,068,550, Cl. 307-475.000.
Bruder, Herbert; Fischer, Hubertus; Schmitt, Franz; and Reinfelder, Hans-Erich, 5,068,609, Cl. 324-309.000.
Feucht, Peter, 5,067,953, Cl. 606-34.000.
Frunder, Henning; and Wiedemer, Manfred, 5,067,404, Cl. 101-488.000.
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Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, 5,068,600, Cl. 324-158.00F.
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Schirbl, Reinhard; Deinhardt, Gunther; and Kasowski, Hermann, 5,067,785, Cl. 385-38.000.
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Schwarzbauer, Herbert, 5,067,647, Cl. 228-5.500.
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Szyszkowski, Andrew J., 5,067,903, Cl. 439-55.000.
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Sigwalt, Paul: *See*—
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Simandi, Laszlo : *See*—
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Singhal, Gophal H., to Exxon Research & Engineering Company. Substituted noble metal xanthates. 5,068,375, Cl. 556-136.000.
Sisk, David E. In-line air filter for dry bulk tank trailers. 5,067,856, Cl. 406-41.000.
Sit, Sing-Yuen; and Wright, John J., to Bristol-Myers Company. Tetrazole compounds. 5,068,346, Cl. 548-253.000.
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Smith, Kim R.: *See*—
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Smith, Morton R.; and Maassel, James L. Process for converting a fluid system of a machine from an oil based fluid system to a water based fluid system. 5,068,129, Cl. 427-239.000.
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Smith, Rebecca F.: *See*—
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Smith, W. Novis; and Louer, Christopher, to Cyprus Foote Mineral Company. Stabilized lithium acetylide and reactions therewith. 5,068,368, Cl. 552-556.000.
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
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Sonnenberg, Wade: *See*—
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Sparrow, James A.: *See*—
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Kleyer, Don L.; and Speier, John L., 5,068,387, Cl. 556-485.000.

Spencer, Donald J.: *See*—
Mirels, Harold; Spencer, Donald J.; and Hofland, Robert, Jr., 5,067,801, Cl. 359-666.000.

Spiers, Steven F.: *See*—
Brookman, Donald L.; Grollimund, Everett C.; Grollimund, Gary E.; and Spiers, Steven F., 5,067,303, Cl. 53-381.200.

Spinner, Charles R., III; and Kiou, Fu-Tai, to SGS-Thomson Microelectronics, Inc. Method for forming a high valued resistive load element and low resistance interconnect for integrated circuits. 5,068,201, Cl. 437-60.000.

Spohr, Horst; and Huegin, Walter, to bautex Adolf Stoever Soehne KG. Worm drive for setting the angular position of vertical lamella blinds. 5,067,544, Cl. 160-177.000.

Sporleder, Arthur O. Refuse disposal device. 5,067,425, Cl. 114-26.000.

Sports Licensing, Inc.: *See*—
Brine, William H., III; and Brine, Peter J., 5,067,726, Cl. 273-326.000.

Spreckelmeyer, Bernhard: *See*—
Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, 5,068,015, Cl. 204-89.000.

Sramek, John A., to S. C. Johnson & Son, Inc. Hair spray package with low volatile organic compound emission. 5,068,099, Cl. 424-47.000.

SRI International: *See*—
Mooney, John B.; and Sher, Arden, 5,068,695, Cl. 357-16.000.

Staffanson, Leroy. Hay bale unroller. 5,067,870, Cl. 414-724.000.

Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Process for splicing the ends of two double yarns. 5,067,315, Cl. 57-22.000.

Stahlecker, Hans: *See*—
Stahlecker, Fritz, 5,067,315, Cl. 57-22.000.

Staller, Steven E.: *See*—
Logsdon, James H.; Staller, Steven E.; De Roo, David W.; and Neudeck, Gerold W., 5,068,203, Cl. 437-89.000.

Standard Oil Company: *See*—
Bartek, Joseph P.; Brazdil, James F., Jr.; Hupp, John M.; and Grasselli, Robert K., 5,068,215, Cl. 502-208.000.
Paspek, Stephen C.; Hauser, Jeffrey B.; Eppig, Christopher P.; and Adams, Harry A., 5,068,027, Cl. 208-125.000.

Staniszewski, Tadeusz, to Shap Inc. Mounting device. 5,067,846, Cl. 403-370.000.

Stanley Electric Co., Ltd.: *See*—
Umeda, Toru; Kondo, Hidetaka; and Kato, Kouichi, 5,068,769, Cl. 362-61.000.

Star Semiconductor Corporation: *See*—
Robinson, Jeffrey I., 5,068,823, Cl. 395-500.000.

Stark, William D.; and Prestas, Gregory C., to Array Analysis, Inc. Interactive adaptive inference system. 5,068,814, Cl. 364-580.000.

Starr, Tina F. Oil absorbent. 5,067,984, Cl. 134-7.000.

Statman, Joseph I.: *See*—
Collins, Oliver; Dolinar, Samuel J., Jr.; Hus, In-Shek; Bozzola, Fabrizio P.; Olson, Erlend M.; Statman, Joseph I.; and Zimmerman, George A., 5,068,859, Cl. 371-43.000.

Stauffer. Jr., Harold F.: *See*—
Taylor, Chandler R., Jr.; Cale. Jr., Albert D.; Johnson, David N.; and Stauffer. Jr., Harold F., 5,068,231, Cl. 514-210.000.

Stauffer, Larry R.: *See*—
Egner, Walter A.; Schaffer, Ronald R.; Stauffer, Larry R.; and Warner, Gary N., 5,067,226, Cl. 29-452.000.

Steel, Geoffrey, to British Aerospace Public Limited Company. Sound generating transducer. 5,068,836, Cl. 367-174.000.

Steele, Michael F., to Brunswick Corporation. Method and apparatus for aligning spin-stabilized self-propelled missiles. 5,067,385, Cl. 89-1.808.

Steele, Michael F.: *See*—
Shiovitz, Nathan N.; Maloney, John G.; and Steele, Michael F., 5,067,386, Cl. 89-1.808.

Stefani, Fabrizio: *See*—
Botti, Edoardo; Stefani, Fabrizio; and Nebuloni, Daniela, 5,068,620, Cl. 330-2.000.

Steiner, Eginhard; Beyeler, Harry; and Husler, Rinaldo, to Ciba-Geigy Corporation. Novel nitrogen-containing titanocenes, and the use thereof. 5,068,371, Cl. 556-53.000.

Steiner, Klaus; Herrmann, Wolfgang; Crone, Gunter; and Combs, Charles S., to Godecke Aktiengesellschaft. Process for the preparation of cyclic amino acids and intermediates useful in the process. 5,068,413, Cl. 562-507.000.

Steltzer, Gordon L.: *See*—
Grillo, John M.; Hilby, James A.; La Croix, Mark E.; Polinsky, Mark A.; and Steltzer, Gordon L., 5,067,350, Cl. 73-494.000.

Stemmler, Kurt, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG. Method and apparatus for manufacturing interfolded toweling. 5,067,698, Cl. 270-39.000.

Stendel, Wilhelm: *See*—
Fuchs, Rainer; Erdelen, Christoph; Becker, Benedikt; and Stendel, Wilhelm, 5,068,241, Cl. 514-403.000.

Steneker, Daniel J.: *See*—
Scherk, Randall P.; and Steneker, Daniel J., 5,068,888, Cl. 379-100.000.

Sterling Drug Inc.: *See*—
D'Ambra, Thomas E.; Bacon, Edward R.; Bell, Malcolm R.; Carabateas, Philip M.; Eissenstat, Michael A.; Kumar, Virendra; Mallamo, John P.; and Ward, Susan J., 5,068,234, Cl. 514-235.200.

Stevanovic, Maya D.: *See*—
Malhotra, Shadi L.; Martins, Maria L.; Stevanovic, Maya D.; and Jones, Arthur Y., 5,068,140, Cl. 428-216.000.

Stevenson, James F.; and Miller, William H., to GenCorp Inc. Rapid change die assembly. 5,067,885, Cl. 425-131.100.

Steyr-Daimler-Puch AG: *See*—
Moser, Franz, 5,067,319, Cl. 60-288.000.

Stiffler, Stephen P.; Beach, Wayne H.; and Frost, Robert L., to Kennametal Inc.; and Reedrill, Inc. Digging tooth. 5,067,262, Cl. 37-142.00R.

Stile, Thomas W. Dental apparatus for flossing teeth. 5,067,503, Cl. 132-324.000.

Stobbs, Thomas J.: *See*—
Patel, Kishor J.; and Stobbs, Thomas J., 5,067,687, Cl. 251-129.080.

Stockham, Charles: *See*—
Goodenough, David J.; and Stockham, Charles, 5,068,788, Cl. 364-413.140.

Stohr, Hans-Arnold: *See*—
Paques, Eric P.; and Stohr, Hans-Arnold, 5,068,106, Cl. 424-94.300.

Stong, Gayvin E.: *See*—
Dervisoglu, Bulent I.; and Stong, Gayvin E., 5,068,881, Cl. 377-70.000.

Stout, James C., to Honeywell Inc. Fiber optic network architecture having data feedback for monitoring communications thereon. 5,068,847, Cl. 359-118.000.

Stout, James T., to Mead Corporation, The. Packaging and display case for dissimilar objects. 5,067,609, Cl. 206-45.110.

Stowe, David W.: *See*—
Gillham, Frederick J.; and Stowe, David W., 5,067,787, Cl. 385-50.000.

Stowell, Brian D.: *See*—
Stowell, Norman L.; Stowell, Brian D.; and Stowell, Gregory T., 5,067,200, Cl. 16-237.000.

Stowell, Gregory T.: *See*—
Stowell, Norman L.; Stowell, Brian D.; and Stowell, Gregory T., 5,067,200, Cl. 16-237.000.

Stowell, Norman L.; Stowell, Brian D.; and Stowell, Gregory T. Hinge for inset doors. 5,067,200, Cl. 16-237.000.

Strandholm, John J., to Kraft General Foods, Inc. Method of making simulated cheese containing casein materials. 5,068,118, Cl. 426-582.000.

Strang, Harry: *See*—
Andree, Roland; Haug, Michael; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,068,394, Cl. 560-56.000.

Strauss, Guenther: *See*—
Falk, Holger; and Strauss, Guenther, 5,068,217, Cl. 502-330.000.

Strebelle, Michel, to Solvay & Cie. Process for the purification of vinyl chloride. 5,068,474, Cl. 570-238.000.

Streckert, Holger H.; Sheehan, James E.; and Mazdiyasni, Khodabakhsh, to General Atomics. Method for providing a silicon carbide matrix in carbon-fiber reinforced composites. 5,067,999, Cl. 156-89.000.

Strid, Eric W.; and Leake, Bernard W., to Cascade Microtech, Inc. Noise parameter test apparatus. 5,068,615, Cl. 324-613.000.

Stromswold, Daivd C.: *See*—
Allen, L. Scott; Mills, William R.; and Stromswold, Daivd C., 5,068,531, Cl. 250-269.000.

Struglinski, Mark J.: *See*—
Chung, David Y.; and Struglinski, Mark J., 5,068,047, Cl. 252-051.50A.

Stryker Corporation: *See—*
Richmond, James W.; and Block, John J., 5,067,964, Cl. 623-18.000.

Sudou, Masaru: *See—*
Tanaka, Masahide; Agou, Tokinori; Kuwahara, Masahiro; Sakashita, Takeshi; Shimoda, Tomoaki; and Sudou, Masaru, 5,068,400, Cl. 560-223.000.

Suganuma, Yoshimi: *See—*
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 5,068,742, Cl. 358-296.000.

Sugimoto, Kenichi: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; Suzuki, Tomoko; and Kan, Hirofumi, 5,068,815, Cl. 364-713.000.

Sugimoto, Yoshihito: *See—*
Takahashi, Wataru; Sugimoto, Yoshihito; Nakanishi, Mutsuo; Shida, Yoshiaki; and Okada, Minoru, 5,068,003, Cl. 148-421.000.

Sugimura, Koichi; Kimura, Fumio; and Izawa, Shigeru, to Kabushiki Kaisha CSK. Systems for inspecting defects in an optical recording medium. 5,067,812, Cl. 356-237.000.

Sugita, Naomasa; Yotumoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, to Kabushiki Kaisha Toshiba. Semiconductor device with fuse function. 5,068,706, Cl. 357-51.000.

Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. Image reader with platen criterial mark for determining document scan start. 5,068,913, Cl. 382-61.000.

Sugiyama, Kenji, to Victor Company of Japan, Ltd. Motion vector estimating apparatus. 5,068,722, Cl. 358-105.000.

Sugiyama, Shouji; Ohtani, Daisuke; and Tajima, Tadao, to Matsushita Electric Industrial Co., Ltd. Portable radio transceiver. 5,068,917, Cl. 455-90.000.

Sugiyama, Yukinori, to NEC Corporation. Bus control for small computer system interface with transfer indication preceding final word transfer and buffer empty indication preceding receipt acknowledgement. 5,068,785, Cl. 395-325.000.

Suitch, Paul R.; Coppage, A. Taylor; and Brown, Alan J., to E.C.C. America Inc. Chemically aggregated mineral pigments. 5,068,276, Cl. 524-413.000.

Sullivan, Gerard J.; Pedrotti, Kenneth D.; and Kroemer, Herbert, to Rockwell International Corporation. Transferred electron effective mass modulator. 5,067,828, Cl. 385-3.000.

Sullivan, James H., to Southwire Company. Method for testing water impervious cable. 5,067,343, Cl. 73-40.700.

Sullivan, Michael T.; and Tock, Gary S., to MTS Systems Corporation. Degree of freedom digital control system for a hydraulic press. 5,068,779, Cl. 364-167.010.

Sulzer Brothers Limited: *See—*
de Jager, Godert, 5,067,527, Cl. 139-435.200.

Sulzer-Escher Wyss AG: *See—*
Mauer, Josef, 5,068,093, Cl. 423-82.000.

Sulzer, Harry E.: *See—*
Frank, Armin C.; and Sulzer, Harry E., 5,067,222, Cl. 29-411.000.

Suman, Michael J.: *See—*
Frye, Dale J.; and Suman, Michael J., 5,067,765, Cl. 296-97.800.

Sumitomo Chemical Company, Limited: *See—*
Horinouchi, Kazuo; Mouri, Masahide; and Kameda, Isao, 5,068,072, Cl. 264-66.000.
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; and Omura, Takashi, 5,068,327, Cl. 544-76.000.
Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,068,283, Cl. 525-64.000.

Sumitomo Electric Industries, Ltd.: *See—*
Nishiyama, Satoshi, 5,067,791, Cl. 385-101.000.

Sumitomo Metal Industries, Ltd.: *See—*
Takahashi, Wataru; Sugimoto, Yoshihito; Nakanishi, Mutsuo; Shida, Yoshiaki; and Okada, Minoru, 5,068,003, Cl. 148-421.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,067,539, Cl. 157-13.000.
Nakamura, Yoshinobu, 5,068,151, Cl. 428-407.000.

Summa; Gareth D.: *See—*
Moore, Archie S., deceased; Teske, Robert J.; and Summa, Gareth D., 5,067,414, Cl. 104-172.200.

Sumner, Charles E., Jr.; Hitch, Brenda J.; and Bernard, Bobby L., to Eastman Kodak Company. Process for preparation of resorcinol. 5,068,460, Cl. 568-648.000.

Sun Chemical Corporation: *See—*
Patel, Narendra M.; and Di Leo, Leonard, 5,068,273, Cl. 524-166.000.

Sun Electric Corporation: *See—*
Kreft, Keith A.; Dikopf, Michael; and Loewe, Thomas D., 5,068,613, Cl. 324-379.000.

Sun Microsystems, Inc.: *See—*
Valdes, Jacobo; and Martinez, Eduardo, 5,068,803, Cl. 395-150.000.

Sunata, Tomihisa: *See—*
Ukai, Yasuhiro; Sunata, Tomihisa; Yukawa, Teizou; and Inada, Toshiya, 5,068,748, Cl. 359-59.000.

Sunbeam Plastics Corporation: *See—*
Julian, Randall K.; and Luker, Edward, 5,067,891, Cl. 425-533.000.

Sunds Defibrator AB: *See—*
Reinhall, Rolf B., 5,067,660, Cl. 241-37.000.

Sundstrand Corporation: *See—*
Glennon, Timothy F.; Mehl, Byron R.; Thollot, Pierre; and Krinickas, Alexander, 5,068,590, Cl. 322-10.000.
Hoegberg, Lon; and Maddali, Vijay, 5,068,591, Cl. 322-29.000.

Sunohara, Izuru: *See—*
Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 5,068,746, Cl. 358-443.000.

Suntory Limited: *See—*
Ohfune, Yasufumi; Shimamoto, Keiko; Shinozaki, Haruhiko; and Ishida, Michiko, 5,068,412, Cl. 562-506.000.

Sussman, David P. Portable pill crusher. 5,067,666, Cl. 241-36.000.

Sussman, Harold I. Device for cleaning dental implant posts. 5,067,195, Cl. 15-167.001.

Sutherland, Dennis W., to Rockwell International Corporation. System and method for monitoring and reporting out-of-route mileage for long haul trucks. 5,068,656, Cl. 340-989.000.

Sutter, Franz: *See—*
Nuber, Roland; Schubert, Werner; Sohler, Wolfgang; and Sutter, Franz, 5,067,557, Cl. 165-51.000.

Sutter, Marius: *See—*
Huxley, Alica; Kunz, Walter; Ackermann, Peter; and Sutter, Marius, 5,068,359, Cl. 549-58.000.

Suzuka, Susumu: *See—*
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 5,068,350, Cl. 548-444.000.

Suzuki, Akihiro: *See—*
Tuchiya, Kazumichi; Nagashima, Nobuhara; Wasada, Masayoshi; and Suzuki, Akihiro, 5,068,735, Cl. 358-209.000.

Suzuki, Akira, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switch having a locking mechanism. 5,068,506, Cl. 200-526.000.

Suzuki, Fumio; Shimada, Junichi; Kubo, Kazuhiro; Ohno, Tetsuji; Karasawa, Akira; Ishii, Akio; and Nonaka, Hiromi, to Kyowa Hakko Kogyo Co., Ltd. Xanthine derivatives. 5,068,236, Cl. 514-263.000.

Suzuki, Hideo: *See—*
Kuroda, Yasuhiro; and Suzuki, Hideo, 5,067,290, Cl. 52-208.000.
Nojima, Satoshi; Sakagawa, Kazuo; and Suzuki, Hideo, 5,068,820, Cl. 395-275.000.

Suzuki, Hiroyuki: *See—*
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,067,447, Cl. 123-3.000.

Suzuki, Kazuichi: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,068,081, Cl. 376-261.000.

Suzuki, Keiichiro: *See—*
Fukukawa, Takao; and Suzuki, Keiichiro, 5,067,841, Cl. 403-140.000.

Suzuki, Makoto: *See—*
Hisada, Hidenori; and Suzuki, Makoto, 5,068,685, Cl. 355-32.000.

Suzuki Manufacturing Co., Ltd.: *See—*
Sakuma, Kouichi, 5,067,422, Cl. 112-68.000.

Suzuki, Motokazu: *See—*
Hagino, Sadaaki; Suzuki, Motokazu; Kondo, Hideyuki; Nishikawa, Shigeru; and Hayashi, Kenichi, 5,068,219, Cl. 505-1.000.

Suzuki, Nobuo: *See—*
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 5,068,350, Cl. 548-444.000.

Suzuki, Riichiro; Akiyama, Shigeyuki; and Kubo, Yoshihiro, to Horiba, Ltd. Apparatus for measuring fine particles in liquid. 5,067,814, Cl. 356-339.000.

Suzuki, Takumi; and Uehara, Kiyohiro, to Ricoh Company, Ltd. Liquid crystal display device with cut-out portions in lead electrodes for connection to driving circuit. 5,067,796, Cl. 359-88.000.

Suzuki, Tomoko: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; Suzuki, Tomoko; and Kan, Hirofumi, 5,068,815, Cl. 364-713.000.

Suzuki, Tomonari; Wada, Hiroshi; Yoshimoto, Yoshikazu; and Yoshida, Masaru, to Sharp Kabushiki Kaisha. Process for producing graphite electrodes. 5,068,126, Cl. 427-122.000.

Suzuki, Toyoo: *See—*
Shinkai, Kunio; Suzuki, Toyoo; Nomura, Yukitaka; Kurachi, Yoshio; and Kureishi, Hiroyuki, 5,067,204, Cl. 19-159.00A.

Suzuki, Yutaka, to Nissan Motor Co., Ltd. Control system for continuously variable transmission. 5,067,372, Cl. 74-866.000.

Swallen, William R.: *See—*
Weedling, Robert E.; Swallen, William R.; Johnson, Raynor; Wegener, Jack; and Davis, David T., 5,067,189, Cl. 5-81.00R.

Swanson, Dail L.; Green, Raymond M.; and Bennorth, Gregory S., to Valmont Industries, Inc. Wall box dimmer. 5,068,639, Cl. 338-179.000.

Swanson, Eric J.; and Del Signore, Bruce P., to Crystal Semiconductor Corporation. Combining fully-differential and single-ended signal processing in a delta-sigma modulator. 5,068,660, Cl. 341-143.000.

Swearingen, Steven H.: *See—*
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

Sweeney, Gerald T., to Aardvark Corporation. Apparatus and technique for installing an elongated rod in an earth formation. 5,067,854, Cl. 405-184.000.

Swinkels, Johannes M. M.: *See—*
Dona, Marinus J. J.; and Swinkels, Johannes M. M., 5,067,377, Cl. 82-138.000.

Sydansk, Robert D., to Marathon Oil Company. Selective placement of a permeability-reducing material to inhibit fluid communication between a near well bore interval and an underlying aquifer. 5,067,564, Cl. 166-270.000.

Synaptics, Incorporated: *See*—
Mead, Carver A.; and Allen, Timothy P., 5,068,622, Cl. 330-253.000.

Syntex (U.S.A.) Inc.: *See*—
DeHoff, Bradley S., 5,068,360, Cl. 549-74.000.
Gibbons, Ian; Ullman, Edwin F.; and Felgner, Philip L., 5,068,198, Cl. 436-535.000.

Systems Division Incorporated: *See*—
Korbonski, John A., 5,067,859, Cl. 408-1.00R.

Szablikowski, Klaus: *See*—
Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, 5,068,321, Cl. 536-32.000.

Szabo, Steve B.; and Chien, Daniel G., to Rockwell International Corporation. Seal assembly. 5,067,732, Cl. 277-11.000.

Szatmari, Sandor: *See*—
Schaefer, Fritz P.; Szatmari, Sandor; and Jethwa, Jaydev, 5,068,525, Cl. 250-213.0VT.

Szmanda, Jeffrey P.; and Szmanda, William J. Input keyboard apparatus for information processing device and other keyboard devices. 5,067,834, Cl. 400-489.000.

Szmanda, William J.: *See*—
Szmanda, Jeffrey P.; and Szmanda, William J., 5,067,834, Cl. 400-489.000.

Szyszkowski, Andrew J., to Siemens-Pacesetter, Inc. Ribbon conductor set and method. 5,067,903, Cl. 439-55.000.

T. Goldschmidt AG: *See*—
Ruf, Erich, 5,068,374, Cl. 556-105.000.

T Z & B Products: *See*—
Tomlinson, David L., 5,067,329, Cl. 62-457.400.

Tabakoff, Boris: *See*—
Hendricks, Katherine A., 5,067,941, Cl. 600-27.000.

Tabata, Akihiko: *See*—
Kunimi, Yuji; Tabata, Akihiko; and Fujita, Yatsuka, 5,068,467, Cl. 568-852.000.

Tabata, Kuniaki: *See*—
Watanabe, Tan; Nishino, Hideki; Iwami, Hidefumi; and Tabata, Kuniaki, 5,068,804, Cl. 395-147.000.

Tagami, Shigeru; Umedu, Yoshio; and Niwa, Katsuhito, to Seikosha Co., Ltd. Small stepping motor. 5,068,562, Cl. 310-256.000.

Tagawa, Shinichi: *See*—
Kokubo, Kouichi; Tagawa, Shinichi; Kawanishi, Masaki; Sato, Kunihito; Buma, Shuuichi; Yonekawa, Takashi; and Aburaya, Toshio, 5,067,743, Cl. 280-707.000.

Tagomori, Satoshi: *See*—
Fujisawa, Masao; Tagomori, Satoshi; Takasaki, Mamoru; and Sato, Yoshihiro, 5,067,851, Cl. 405-115.000.

Taguchi, Eiji: *See*—
Kiuchi, Naoyuki; Fujimaru, Masanori; Nakagawa, Susumu; Taguchi, Eiji; Kasagi, Masao; Kimura, Akio; and Kawabe, Shinji, 5,067,413, Cl. 104-168.000.

Taiho Pharmaceutical Company, Limited: *See*—
Hasegawa, Etsuo; Kawaguchi, Akihiro; Kajitani, Makoto; Yasumoto, Mitsugi; Kasahara, Nobuo; and Yamamoto, Junji, 5,068,235, Cl. 514-258.000.

Taira, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Color image recording apparatus having trial printing with variable exposure. 5,068,686, Cl. 355-32.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Murata, Mitsuo; Yokoo, Chihiro; and Hanada, Kazunori, 5,068,354, Cl. 548-517.000.

Taito Co., Ltd.: *See*—
Fujita, Tetsuro; Ikumoto, Takeshi; Sasaki, Shigeo; Kenji, Chiba; and Hoshino, Yukio, 5,068,247, Cl. 514-440.000.

Tajima, Tadao: *See*—
Sugiyama, Shouji; Ohtani, Daisuke; and Tajima, Tadao, 5,068,917, Cl. 455-90.000.

Takagaki, Hidetsugu; Nakanishi, Shigenori; Abe, Masayoshi; Ohki, Hiromi; and Sano, Yoshiyuki, to Dainippon Ink and Chemicals, Inc. Chalcone derivatives and process for producing the same. 5,068,364, Cl. 549-415.000.

Takagawa, Makoto; Yamagishi, Ken; Yoshihara, Jyun; Inamasa, Kenji; and Watabe, Kumiko, to Mitsubishi Gas Chemical Company, Inc. Process for producing 2,6-dimethylnaphthalene. 5,068,480, Cl. 585-411.000.

Takagi, Izumi: *See*—
Hardesty, Lee R.; and Takagi, Izumi, 5,067,933, Cl. 475-32.000.

Takagi, Kazutoshi: *See*—
Kitajima, Nobuaki; and Takagi, Kazutoshi, 5,067,804, Cl. 359-369.000.

Takagi, Kotaro; and Yokoya, Satoshi, to Sony Corporation. Charge pump circuit. 5,068,626, Cl. 331-17.000.

Takahama, Yoshihiro; Kurihara, Kazushige; and Nishiya, Takayuki, to Shimizu Construction Co., Ltd. Dome structure. 5,067,288, Cl. 52-80.000.

Takahashi, Katsutoshi: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 5,068,376, Cl. 556-137.000.

Takahashi, Kenji: *See*—
Kondo, Tetsujiro; and Takahashi, Kenji, 5,068,726, Cl. 358-135.000.

Takahashi, Masatomo, to Canon Kabushiki Kaisha. Image output apparatus for reproducing, adjacent each other, leading image data portions of plural image units. 5,068,741, Cl. 358-296.000.

Takahashi, Miyao: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; and Omura, Takashi, 5,068,327, Cl. 544-76.000.

Takahashi, Satoshi: *See*—
Kato, Hisataka; and Takahashi, Satoshi, 5,067,235, Cl. 29-890.043.

Takahashi, Shuji: *See*—
Ozawa, Osamu; Takahashi, Shuji; and Igarashi, Shigeru, 5,068,137, Cl. 428-36.200.

Takahashi, Tadashi: *See*—
Okamura, Yoshio; Takarada, Mitsuhiro; Kobayashi, Yoshiteru; and Takahashi, Tadashi, 5,068,301, Cl. 528-15.000.

Takahashi, Tastuhiko: *See*—
Tanaka, Masakatsu; Itoh, Masanobu; Arabori, Noboru; Nara, Toshihiko; Takahashi, Tastuhiko; Masuda, Katutaro; and Saito, Mitsuo, 5,067,593, Cl. 187-73.000.

Takahashi, Toshimasa: *See*—
Fudono, Kanji; Takahashi, Toshimasa; Ogawa, Hiroshi; and Yamashita, Toshio, 5,067,556, Cl. 165-29.000.

Takahashi, Wataru; Sugimoto, Yoshihito; Nakanishi, Mutsuo; Shida, Yoshiaki; and Okada, Minoru, to Sumitomo Metal Industries, Ltd. Wear-resistant titanium alloy and articles made thereof. 5,068,003, Cl. 148-421.000.

Takajo, Shigeaki: *See*—
Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, 5,067,979, Cl. 75-243.000.

Takakura, Yoshio: *See*—
Ban, Takeshi; Matsunaga, Shigeru; Hirano, Hidemi; Isobe, Tuguo; and Takakura, Yoshio, 5,067,555, Cl. 164-480.000.

Takami, Harumi, successor: *See*—
Matsumoto, Hisashi; and Takami, Masaaki, deceased, 5,068,133, Cl. 427-358.000.

Takami, Masaaki, deceased: *See*—
Matsumoto, Hisashi; and Takami, Masaaki, deceased, 5,068,133, Cl. 427-358.000.

Takami, Masao: *See*—
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,067,539, Cl. 157-13.000.

Takaoka, Toshio: *See*—
Kushi, Naoto; Takaoka, Toshio; and Muramatsu, Motoyasu, 5,067,579, Cl. 180-197.000.
Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,067,465, Cl. 123-489.000.

Takarada, Mitsuhiro: *See*—
Okamura, Yoshio; Takarada, Mitsuhiro; Kobayashi, Yoshiteru; and Takahashi, Tadashi, 5,068,301, Cl. 528-15.000.

Takasaki, Hidenori: *See*—
Matsushima, Eiji; and Takasaki, Hidenori, 5,067,436, Cl. 118-676.000.

Takasaki, Mamoru: *See*—
Fujisawa, Masao; Tagomori, Satoshi; Takasaki, Mamoru; and Sato, Yoshihiro, 5,067,851, Cl. 405-115.000.

Takashima, Atsuyuki: *See*—
Yamato, Toshitaka; Ito, Tatsuo; Takashima, Atsuyuki; and Motojima, Akira, 5,068,897, Cl. 381-24.000.

Takashima, Kazutoshi, to Sanshin Kogyo Kabushiki Kaisha. Piston of two-cycle engine. 5,067,453, Cl. 123-193.00P.

Takashima, Tadashi: *See*—
Koda, Yoshiharu; and Takashima, Tadashi, 5,068,574, Cl. 315-225.000.

Takata, Tadahiko: *See*—
Nose, Kenkichi; Takata, Tadahiko; and Tsuge, Masuo, 5,068,142, Cl. 428-232.000.

Takatsu, Haruyoshi: *See*—
Sasaki, Makoto; Takatsu, Haruyoshi; and Takeuchi, Kiyofumi, 5,068,462, Cl. 568-661.000.

Takayama, Hajime: *See*—
Akatsu, Masahiro; Takayama, Hajime; and Matsuoka, Takeshi, 5,068,481, Cl. 585-426.000.
Akatsu, Masahiro; Takayama, Hajime; and Matsuoka, Takeshi, 5,068,482, Cl. 585-429.000.

Takayama, Jun; Fujita, Tadao; and Ninomiya, Takeshi, to Sony Corporation. Sampling rate converter. 5,068,716, Cl. 358-13.000.

Takebe, Hideharu; and Okura, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Image display apparatus. 5,068,651, Cl. 340-814.000.

Takechi, Satoshi; Nakamura, Yuko; and Mihara, Yukari, to Fujitsu Limited. Process for production of semiconductor device. 5,068,169, Cl. 430-313.000.

Takeda, Akihiko, to Yoshida Kogyo K.K. Method of attaching curtain wall units to a building skeleton framework. 5,067,300, Cl. 52-745.000.

Takeda, Mamoru: *See*—
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,067,447, Cl. 123-3.000.

Takehara, Hiroshi; and Ikeda, Hideo, to Fumi Photo Film Co., Ltd. Photosensitive silver halide emulsions containing parallel multiple twin silver halide grains and photographic materials containing the same. 5,068,173, Cl. 430-567.000.

Takehara, Nobumitsu: *See*—
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 5,068,742, Cl. 358-296.000.

Takenaka, Shinji: *See*—
Oi, Ryu; Takenaka, Shinji; and Shimakawa, Chitoshi, 5,068,459, Cl. 568-638.000.

Takeo, Hideya, to Fuji Photo Film Co., Ltd. Method of recognizing irradiation field. 5,068,907, Cl. 382-48.000.

Takeshita, Nobuo; and Fujita, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Optical read-write apparatus. 5,068,843, Cl. 369-44.130.

Takeuchi, Kesatoshi, to Seiko Epson Corporation. Video image enlargement and reduction system and method. 5,068,731, Cl. 358-180.000.

Takeuchi, Kiyofumi: *See*—
Sasaki, Makoto; Takatsu, Haruyoshi; and Takeuchi, Kiyofumi, 5,068,462, Cl. 568-661.000.

Takeuchi, Shigeru; Murayama, Takayuki; Horiguchi, Motokuni; and Hukunaga, Masami, to Kabushiki Kaisha Hitachi Seisakusho; Hitachi Micro Computor Engineering Kabushiki Kaisha; and Enplas Corporation. IC socket. 5,067,904, Cl. 439-73.000.

Takeuchi, Yukihisa: *See*—
Okajima, Atsushi; Yamazaki, Yasuou; Okamoto, Yasuhide; Nozawa, Masaei; Takeuchi, Yukihisa; and Akado, Hajime, 5,067,455, Cl. 123-196.00R.

Taljan, Dennis N.; and Price, R. Douglas, to PPG Industries, Inc. Acid etch resistant clear coats. 5,068,288, Cl. 525-155.000.

Tamaoki, Akihiro: *See*—
Kumai, Seisaku; Yokokoji, Osamu; and Tamaoki, Akihiro, 5,068,449, Cl. 568-335.000.

Tamayama, Hiroshi: *See*—
Iwabe, Kazuki; Kubo, Naoki; Tamayama, Hiroshi; Yano, Takashi; Soga, Takashi; and Koike, Hitoshi, 5,068,718, Cl. 358-27.000.

Tamura, Tadahiko: *See*—
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,067,539, Cl. 157-13.000.

Tan, Karen: *See*—
Pal, Jack M.; Cosman, James P.; and Tan, Karen, 5,068,280, Cl. 524-728.000.

Tanabe, Kazunori, to Brother Kogyo Kabushiki Kaisha. Device for automatically loading an image recording apparatus with a recording medium. 5,068,688, Cl. 355-99.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Samejima, Masayoshi; Noda, Kazuo; Hirakawa, Yoshiyuki; and Yoshino, Hiroyuki, 5,068,112, Cl. 424-495.000.

Tanagawa, Kouji; and Yoshida, Tomoaki, to Oki Electric Industry Co., Ltd. Microcomputer having a built-in PROM for storing an optional program. 5,068,783, Cl. 395-575.000.

Tanaka, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Objective lens mount utilizing leaf springs. 5,068,844, Cl. 369-44.160.

Tanaka, Hiroshi; Ishiwata, Tetsuo; Hitotsumachi, Shuzo; Komae, Hitoshi; Yamaguchi, Susumu; Yoshino, Tadashi; and Yamauchi, Eiji, to Matsushita Electric Industrial Co., Ltd. Apparatus for recording/reproducing a digital audio signal with a video signal. 5,068,752, Cl. 360-32.000.

Tanaka, Hirotoshi: *See*—
Yasunaga, Moritoshi; Masuda, Noboru; Todokoro, Hideo; Umemoto, Yasunari; Tanaka, Hirotoshi; and Itoh, Hiroyuki, 5,068,605, Cl. 324-158.00R.

Tanaka, Masahide; Agou, Tokinori; Kuwahara, Masahiro; Sakashita, Takeshi; Shimoda, Tomoaki; and Sudou, Masaru, to Mitsui Petrochemical Industries, Ltd. Fluorine-containing mono- or poly-alkylene glycol and method for producing same. 5,068,400, Cl. 560-223.000.

Tanaka, Masakatsu; Itoh, Masanobu; Arabori, Noboru; Nara, Toshihiko; Takahashi, Tastuhiko; Masuda, Katutaro; and Saito, Mitsuo, to Hitachi, Ltd. Braking device for elevator winding machine and elevator using the braking device. 5,067,593, Cl. 187-73.000.

Tanaka, Masaki: *See*—
Meguriya, Noriyuki; Azechi, Syuuichi; and Tanaka, Masaki, 5,068,380, Cl. 556-428.000.

Tanaka, Nobuo: *See*—
Negi, Taichi; Hirofuji, Satoshi; Tanaka, Nobuo; and Kawai, Syuji, 5,068,077, Cl. 264-512.000.

Tanaka, Teruhiko, to Kabushiki Kaisha Daikin Seisakusho. Double wrap brake band and its manufacturing method. 5,067,227, Cl. 29-469.000.

Tanaka, Toru; and Inari, Masato, to Mitsubishi Gas Chemical Company, Inc. Process for producing highly pure 2,6-naphthalene dicarboxylic acid. 5,068,410, Cl. 562-483.000.

Tanaka, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Cyclic data transmission method. 5,068,849, Cl. 370-85.500.

Tanaka, Yuji: *See*—
Abe, Nobumasa; Kobayashi, Atsushi; Watanabe, Koji; Morishita, Norio; and Tanaka, Yuji, 5,068,684, Cl. 355-27.000.

Taneichi, Yoshio; and Fujiwara, Yukinari, to Hitachi Denshi Kabushiki Kaisha. Amplifier. 5,068,624, Cl. 330-293.000.

Taneoka, Tadayuki: *See*—
Owada, Nobuo; Horiuchi, Mitsuaki; Tsuneoka, Masatoshi; and Taneoka, Tadayuki, 5,068,710, Cl. 357-71.000.

Tang, Gernia: *See*—
Pors, Gary A.; and Tang, Gernia, 5,068,707, Cl. 357-59.000.

Tang, Wing T.: *See*—
Betterton, Kathleen M.; Hinsberg, William D.; Nguyen, Huu T.; Tang, Wing T.; and Twieg, Robert J., 5,068,054, Cl. 252-299.620.

Tani, Yasunori: *See*—
Kaneaki, Tetsuhiko; Nuriya, Kozo; and Tani, Yasunori, 5,068,661, Cl. 341-143.000.

Taniguchi, Masato, to NGK Spark Plug. Ceramic camshaft. 5,067,369, Cl. 74-567.000.

Taniguchi, Masayuki: *See*—
Kobayashi, Hironobu; Azuhata, Shigeru; Narato, Kiyoshi; Sohma, Kenichi; Yoshii, Yasuo; Arashi, Norio; Nishimoto, Shigekazu; Koyama, Isao; Inata, Tooru; Kikuchi, Hideo; Murakami, Tadayoshi; Taniguchi, Masayuki; Miyadera, Hiroshi; Koda, Fumio; Enomoto, Tatsuzou; and Kobayashi, Kenshi, 5,067,419, Cl. 110-234.000.

Taniguchi, Nobuyuki; Karasaki, Toshihiko; Ishida, Tokuji; Hamada, Masataka; and Norita, Toshio, to Minolta Camera Kabushiki Kaisha. Image sensor having multiple pairs of array sensors. 5,068,737, Cl. 358-227.000.

Tanimoto, Yoshimitsu; and Kamada, Akitoshi, to Mitsubishi Denki Kabushiki Kaisha. Solenoid valve. 5,067,688, Cl. 251-129.180.

Tanisake, Hiroka: *See*—
Okumura, Hiroyuki; Kurokawa, Masashi; Namikawa, Akira; and Tanisake, Hiroka, 5,068,281, Cl. 524-753.000.

Tanken Seiko Kabushiki Kaisha: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; and Yamauchi, Yuji, 5,067,733, Cl. 277-11.000.

Tarrenn Corporation: *See*—
Christianson, John, 5,067,709, Cl. 272-121.000.

Taub, Floyd: *See*—
Rutherford, Hal; and Taub, Floyd, 5,068,909, Cl. 382-49.000.

Taufer, Peter: *See*—
Burger, Wilfried; Nitschke, Werner; Taufer, Peter; and Weller, Hugo, 5,068,640, Cl. 340-438.000.

Taupier, Roger: *See*—
Waddington, Clive; Lagasse, Normand L.; and Taupier, Roger, 5,067,454, Cl. 123-196.00S.

Tawaki, Shinichirou: *See*—
Mamoru, Takeichi; Naoshi, Hagihara; Hitoshi, Tarukawa; Tawaki, Shinichirou; and Makiguchi, Nobuyoshi, 5,068,187, Cl. 435-106.000.

Taylor, Chandler R., Jr.; Cale. Jr., Albert D.; Johnson, David N.; and Stauffer. Jr., Harold F., to A. H. Robins Company Incorporated. Method of treating muscular tension, muscle spasticity and anxiety with 3-aryloxy and 3-arylthioazetidinecarboxamides. 5,068,231, Cl. 514-210.000.

Taylor, John R.: *See*—
Agger, Reginald T.; Taylor, John R.; and Hardy, Alan, 5,068,143, Cl. 428-241.000.

Taylor, Julian S. High presssure fluid emergency shutoff valve. 5,067,511, Cl. 137-67.000.

Taylor, Maylon S., II; and Williams, Joel L., to Becton, Dickinson and Company. Barrier coating on blood contacting devices. 5,067,491, Cl. [illegible]-748.000.

Taylor, Stewart S.: *See*—
Hayward, Wesley H.; and Taylor, Stewart S., 5,068,621, Cl. 330-253.000.

TDK Corporation: *See*—
Matsuzaki, Mikio, 5,068,759, Cl. 360-103.000.
Nakayama, Masatoshi; Ueda, Kunihiro; and Okamura, Masatoshi, 5,068,146, Cl. 428-336.000.

Technical Systems Corp.: *See*—
Soules, Jack A.; and Carpenter, Bryan D., 5,067,713, Cl. 273-149.00P.

Technicon Instruments Corporation: *See*—
Hwang, Deng R.; and Scott, Mary Ellen A., 5,068,180, Cl. 435-7.920.

Tecumseh Products Company: *See*—
Bonde, Kevin G., 5,067,449, Cl. 123-41.860.

Teetz, Volker; Wissmann, Hans; and Urbach, Hansjorg, to Hoechst Aktiengesellschaft. Process for the preparation of n octahydropenta (6) pyrrole carboxylates. 5,068,351, Cl. 548-452.000.

Teijin Limited: *See*—
Hara, Shigeyoshi; Inata, Hiroo; and Matsumura, Shunichi, 5,068,307, Cl. 528-125.000.
Inata, Hiroo; Matsumura, Shunichi; Itoh, Seiji; and Okada, Masuhiro, 5,068,062, Cl. 252-518.000.
Nose, Kenkichi; Takata, Tadahiko; and Tsuge, Masuo, 5,068,142, Cl. 428-232.000.

Teikoku Seiyaku Kabushiki Kaisha: *See*—
Kawazi, Toshikuni; Ono, Masahiro; and Inoue, Nobuko, 5,068,103, Cl. 424-81.000.

Teillard, Roger: *See*—
Hartemann, Frederic; Bres, Michel; and Teillard, Roger, 5,068,860, Cl. 372-2.000.

Teio Tsushin Kogyo Kabushiki Kaisha: *See*—
Yashina, Kazuo, 5,068,643, Cl. 340-571.000.

Teixeira, Joao C.: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

Tektronix, Inc.: *See*—
DiLazzaro, John F.; McAlpin, James L.; and Mark, Joanne R., 5,068,210, Cl. 501-32.000.
Fields, Walter D.; and Gumm, Linley F., 5,068,614, Cl. 324-534.000.
Mielke, Joseph A., 5,068,602, Cl. 324-158.00F.
Van Horne, Arthur C.; Hoffman, Eldon P.; and Bakke, Paul D., 5,067,705, Cl. 271-277.000.

Teledyne Industries, Inc.: *See*—
Clark, Rodney L.; and Hester, Charles F., 5,068,801, Cl. 395-25.000.

Telefonaktiebolaget L M Ericsson: *See*—
Nortenius, Bengt-Arne; Olsson, Per-Erik B.; and Grip, Nils-Erik G., 5,067,248, Cl. 33-744.000.

Telemecanique: *See*—
Leonard, Didier; and Even, Stephane, 5,068,592, Cl. 323-224.000.

Telschow, Jeffrey E., to Akzo N.V. Purification of N,N-Dialkylcarbamoylmethylphosphine oxide. 5,068,426, Cl. 564-15.000.

Tennigkeit, Jurgen; and Rose, Burkhard, to Goldwell AG. Agent for the long-lasting shaping of hair. 5,068,102, Cl. 424-72.000.

Tenti, Paolo: *See*—
Borgatti, Riccardo; and Tenti, Paolo, 5,068,775, Cl. 363-15.000.

Tenuta, Ralph D.: *See*—
Dewey, George G.; and Tenuta, Ralph D., 5,067,864, Cl. 411-344.000.

Terabe, Kuniyuki: *See*—
Mundstock, Rene ; Terabe, Kuniyuki; Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 5,068,010, Cl. 202-99.000.

Terada, Yasuharu; Ishii, Susumu; and Mizuno, Hiroshi, to Yoshida Kogyo K.K. Slide fastener slider. 5,067,209, Cl. 24-429.000.

Terane, Hideyuki: *See*—
Uramoto, Shinichi; and Terane, Hideyuki, 5,068,818, Cl. 364-734.000.

Terrigno, Matthew. Map scaling instrument. 5,067,249, Cl. 33-773.000.

Tervo, John N.: *See*—
Ball, Larry K.; Hines, Marshall U.; and Tervo, John N., 5,067,506, Cl. 137-1.000.

Teske, Robert J.: *See*—
Moore, Archie S., deceased; Teske, Robert J.; and Summa, Gareth D., 5,067,414, Cl. 104-172.200.

Testardi, David A. High performance anti-lock brake system for original equipment and after-market applications. 5,067,778, Cl. 303-113.00R.

Tetra Pak Holdings S.A.: *See*—
Andersson, Helge, 5,067,311, Cl. 53-551.000.
Jonsson, Tommy, 5,067,614, Cl. 229-123.100.

Tetzlaff, Heribert: *See*—
Miess, Georg-Emerich; Schwarz, Karl-Heinz; Tetzlaff, Heribert; and Wojtech, Bernhard, 5,068,358, Cl. 548-555.000.

Texaco Chemical Company: *See*—
Cuscurida, Michael; McCoy, David R.; and Lin, Jiang-Jen, 5,068,444, Cl. 564-505.000.
Nieh, Edward C. Y., 5,068,456, Cl. 568-618.000.
Sanderson, John R.; and Marquis, Edward T., 5,068,366, Cl. 549-533.000.

Texas Instruments Incorporated: *See*—
Love, Andrew M., 5,068,553, Cl. 307-605.000.
Mahant-Shetti, Shivaling S.; and Harward, Mark G., 5,068,825, Cl. 365-154.000.
Morris, Francis J.; Plumton, Donald L.; Yang, Jau-Yuann; and Yuan, Han-Tzong, 5,068,756, Cl. 357-16.000.
Niehaus, Jeffrey A., 5,068,599, Cl. 324-158.00R.
Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 5,068,589, Cl. 322-7.000.
Tran, Liem T., 5,068,705, Cl. 357-43.000.
Yang, Ping; Chatterjee, Amitava; Aur, Shian; and Polgreen, Thomas L., 5,068,696, Cl. 357-23.100.

Th. Goldschmidt AG: *See*—
Ruf, Erich, 5,068,373, Cl. 556-105.000.

Thaler, Warren A.: *See*—
Brownawell, Darrell W.; Thaler, Warren A.; Bannister, Eric; and Ladwig, Paul K., 5,068,044, Cl. 252-25.000.

Thanisch, Klaus, to Zeller Plastik GmbH. Plastic closure for containers. 5,067,624, Cl. 215-235.000.

Theriot, Kevin J., to Ethyl Corporation. Olefin oligomerization with BF_3 alcohol alkoxylate co-catalysts. 5,068,487, Cl. 585-510.000.

Thermalloy Incorporated: *See*—
Bland, Donald L.; and Smithers, Matthew C., 5,068,764, Cl. 361-386.000.

Theurer, Josef; and Worgotter, Herbert, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Tie plate inserting machine. 5,067,412, Cl. 104-16.000.

Thiele, Dwain L.: *See*—
Lipsky, Peter E.; and Thiele, Dwain L., 5,068,223, Cl. 514-019.000.

Thiem, Joachim: *See*—
Schlingmann, Merten; Keller, Reinhold; Wiesner, Matthias; Treder, Wolfgang; and Thiem, Joachim, 5,068,186, Cl. 435-96.000.

Thigpen, David R.; Lawson, Jimmie B.; and Nelson, Richard C., to Shell Oil Company. Preformed surfactant-optimized aqueous alkaline flood. 5,068,043, Cl. 252-855.400.

Thoen, Bradford K., to MTS Systems Corporation. Phased digital filtering in multichannel environment. 5,068,813, Cl. 364-572.000.

Thollot, Pierre: *See*—
Glennon, Timothy F.; Mehl, Byron R.; Thollot, Pierre; and Krinickas, Alexander, 5,068,590, Cl. 322-10.000.

Thoma, Norman E. Can crusher. 5,067,398, Cl. 100-53.000.

Thomas, Bruce W.: *See*—
Wormald, Malcolm R.; and Thomas, Bruce W., 5,068,532, Cl. 250-270.000.

Thomas, Daniel J., to Container Graphics Corporation. Rotary printing plate washing apparatus. 5,067,193, Cl. 15-88.300.

Thompson, Elmer R. Sewing machine drive assembly, including pulley belt traction enhancement device. 5,067,423, Cl. 112-220.000.

Thompson, Richard A.: *See*—
Brown, Stephen E.; Meeks, Donnie F.; Souders, Ralph W.; and Thompson, Richard A., 5,068,763, Cl. 361-364.000.

Thomsen, Peter. Dispenser pouch and holder and dispensing unit therefor. 5,067,635, Cl. 222-103.000.

Thomson Consumer Electronics, Inc.: *See*—
Sendelweck, Gene K., 5,068,730, Cl. 358-169.000.

Thomson-CSF: *See*—
Champeau, Andre , 5,068,632, Cl. 333-238.000.
Fromont, Bernard, 5,068,834, Cl. 367-135.000.
Meunier, Paul-Louis; Coutellier, Jean-Marc; and Lehureau, Jean-Claude, 5,067,230, Cl. 29-603.000.
Prieur-Drevon, Pascal, 5,068,701, Cl. 357-24.000.

Thomson Tubes Electroniques: *See*—
Hartemann, Frederic; Bres, Michel; and Teillard, Roger, 5,068,860, Cl. 372-2.000.

Thorn EMI Electronics Limited: *See*—
Voles, Roger, 5,068,666, Cl. 342-192.000.

Thorson, Thomas A.: *See*—
Zimmerman, Eckehart; and Thorson, Thomas A., 5,067,382, Cl. 83-879.000.

Three-D Composites Research Corporation: *See*—
Tsuzuki, Makoto; Kimbara, Masahiko; Fukuta, Kenji; and Machii, Akihiko, 5,067,525, Cl. 139-11.000.

Thumm, Helmut: *See*—
Sauter, Willy; Thumm, Helmut; Wahl, Rainer; and Widmann, Dieter, 5,067,371, Cl. 74-813.00L.

Thur, Alex; and Seitz, Kurt, to Wagner International AG. Electrostatic paint spray gun. 5,067,434, Cl. 118-629.000.

Tieka, Bernd: *See*—
Decher, Gero; and Tieka, Bernd, 5,068,318, Cl. 534-573.000.

Tierney, Elaine: *See*—
Batey, John; and Tierney, Elaine, 5,068,124, Cl. 427-39.000.

Tigg Corporation: *See*—
Tiggelbeck, Donald D.; and Patton, Samuel K., 5,068,029, Cl. 210-284.000.

Tiggelbeck, Donald D.; and Patton, Samuel K., to Tigg Corporation. Two-chamber fluid/solids treatment vessel. 5,068,029, Cl. 210-284.000.

Timm, Eberhard. Device for preparing hot drinks. 5,067,395, Cl. 99-282.000.

Timm, Gerald L.: *See*—
Peter, John H.; Timm, Gerald L.; and Wiedenbeck, Roger D., 5,067,824, Cl. 384-99.000.

Ting-Chih, Liu; Sheng-Shun, Hsieh; and Shih-Shiung, Huang. Quantitative liquid level controlling device. 5,067,517, Cl. 137-426.000.

Tioxide Group PLC: *See*—
Robb, Jenifer L., 5,068,056, Cl. 252-313.100.

Tipton Manufacturing Corporation: *See*—
Kobayashi, Hisamine; and Shimizu, Toshiharu, 5,067,860, Cl. 409-185.000.

Tischler, Allan N.; Durette, Philippe L.; Witzel, Bruce E.; Rupprecht, Kathleen M.; Gallagher, Timothy F.; Goldenberg, Marvin M.; and Allison, Debra L., to Merck & Co., Inc. N-alkenyl-3-hydroxybenzo[b]thiophene-2-carboxamide derivatives as dual cyclooxygenase and lipoxygenase inhibitors. 5,068,248, Cl. 514-443.000.

Titcomb, Forrest; Cordova, Jackie; and Schaule, Max W., to Digital Equipment Corporation. Hydrodynamic bearing. 5,067,528, Cl. 141-4.000.

Toa Medical Electronics Co., Ltd.: *See*—
Kosaka, Tokihiro, 5,068,906, Cl. 382-48.000.

Tobias, Samuel; and Hazlehurst, Fred T., to Hayward Industries, Inc. Underdrain assembly with pivotally-mounted and lockable laterals. 5,068,033, Cl. 210-169.000.

Tock, Gary S.: *See*—
Sullivan, Michael T.; and Tock, Gary S., 5,068,779, Cl. 364-167.010.

Toda, Atsushi: *See*—
Oda, Goichi; Shidoh, Masaya; Toda, Atsushi; Ozaki, Akiyoshi; Matsumoto, Akihiro; Yagi, Soichi; and Murata, Atsuhiko, 5,068,570, Cl. 315-128.030.

Toda, Shigeo, to Seiko Epson Corporation. Solid state image sensing device. 5,068,713, Cl. 357-72.000.

Todokoro, Hideo: *See*—
Yasunaga, Moritoshi; Masuda, Noboru; Todokoro, Hideo; Umemoto, Yasunari; Tanaka, Hirotoshi; and Itoh, Hiroyuki, 5,068,605, Cl. 324-158.00R.

Toftkjor, Helle: *See*—
Foldager, Jorgen; Toftkjor, Helle; and Kjornos, Kim, 5,068,109, Cl. 424-441.000.

Toivanen, Tapio. Electrode arrangement. 5,068,023, Cl. 204-196.000.

Toivio, Juha, to Raute Oy. Spindle drive for a veneer lathe. 5,067,534, Cl. 144-209.00R.

Tokai Kogyo Kabushiki Kaisha: *See*—
Arima, Hidetoshi, 5,067,280, Cl. 49-498.000.

Tokudera, Hiromu: *See*—
Nishikawa, Toshio; Okada, Takekazu; Dejima, Hiroki; and Tokudera, Hiromu, 5,068,629, Cl. 333-1.100.

Tokunaga, Takumi; Watanabe, Hiroyuki; Tsuzuki, Kenji; Someya, Sinzo; Koura, Seigo; and Ito, Mikio, to Tosoh Corporation; and Agro-Kanesho Co., Ltd. Hexahydrophthalic anilide derivatives. 5,068,365, Cl. 549-496.000.

Tokyo Aircraft Instrument Co., Ltd.: *See*—
Tsuihiji, Yutaka; and Sakayori, Akio, 5,067,704, Cl. 271-262.000.

Tokyo Electron Limited: *See*—
Tomoyasu, Masayuki, 5,067,798, Cl. 359-286.000.

Tomic, Mladomir: *See*—
Wirth, Lawrence W.; Wegner, Wayne M.; Tomic, Mladomir; Buchko, Raymond; and Natterer, Johann, 5,067,822, Cl. 383-61.000.

Tomida, Yasuko: *See*—
Koike, Shoji; and Tomida, Yasuko, 5,067,980, Cl. 106-22.000.

Tomii, Kaoru; Miyama, Hiroshi; and Kawauchi, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Flat configuration color CRT display apparatus with scanning correction for component positioning error. 5,068,579, Cl. 315-366.000.

Tomlinson, David L., to T Z & B Products; and Tomlinson, David L., a part interest. Canned beverage holder. 5,067,329, Cl. 62-457.400.

Tomordi, Elemer: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 5,068,424, Cl. 562-870.000.

Tomoyasu, Masayuki, to Tokyo Electron Limited. Laser beam scanning system. 5,067,798, Cl. 359-286.000.

Tonelli, Claudio; and Torelli, Vito, to Ausimont, S.r.l. Perfluoroalkenes and fluorination products thereof. 5,068,470, Cl. 570-134.000.

Tong-Lung Metal Industry Co., Ltd.: *See*—
Fann, Yaw-Shin; Chiou, Ming-Shyang; and Kuo, Ching-Chuan, 5,067,758, Cl. 292-347.000.

Torelli, Vito: *See*—
Tonelli, Claudio; and Torelli, Vito, 5,068,470, Cl. 570-134.000.

Toronto Medical Corp.: *See*—
Saringer, John; and Galbreath, Andrew, 5,067,479, Cl. 128-26.000.

Torre, Arturo D.: *See*—
Melloni, Piero; Torre, Arturo D.; Lazzari, Ettore; and Mazzini, Giuseppe, 5,068,433, Cl. 564-349.000.

Torrington Company, The: *See*—
Grillo, John M.; Hilby, James A.; La Croix, Mark E.; Polinsky, Mark A.; and Steltzer, Gordon L., 5,067,350, Cl. 73-494.000.

Torrington Product Ventures, Inc.: *See*—
Weinstein, Lee D., 5,067,441, Cl. 119-29.000.

Torsten, Nilsson, to Petainer S.A. Apparatus for shaping a tubular preform into a hollow body. 5,067,888, Cl. 425-387.100.

Toshiba Kikai Kabushiki Kaisha: *See*—
Kusanagi, Hiroaki, 5,067,401, Cl. 101-148.000.

Toshiba Lighting & Technology Corporation: *See*—
Tsuyuki, Takao; Sato, Shigehiro; and Ootani, Tetsuo, 5,068,517, Cl. 219-543.000.

Tosoh Corporation: *See*—
Kagawa, Takumi; Morooka, Takashi; and Tsuzuki, Kenji, 5,068,336, Cl. 546-302.000.
Tokunaga, Takumi; Watanabe, Hiroyuki; Tsuzuki, Kenji; Someya, Sinzo; Koura, Seigo; and Ito, Mikio, 5,068,365, Cl. 549-496.000.

Toth, Louis, to Aqua-Lawn, Inc. Retractable low voltage lighting fixture. 5,068,773, Cl. 362-386.000.

Toth, Thomas D.: *See*—
Kosem, Marion; Cachat, Anthony J.; and Toth, Thomas D., 5,068,778, Cl. 364-138.000.

Townsend, Bruce L.: *See*—
Ellis, John G.; and Townsend, Bruce L., 5,068,899, Cl. 381-31.000.

Toya, Matsumi, to Kabushiki Kaisha Tiyoda Seisakusho; and Sakura Finetechnical Co., Ltd. Device for dyeing tissues for immune response observation. 5,068,091, Cl. 422-99.000.

Toyo Radiator Co., Ltd.: *See*—
Kato, Hisataka; and Takahashi, Satoshi, 5,067,235, Cl. 29-890.043.

Toyo Seikan Kaisha Ltd.: *See*—
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,068,266, Cl. 523-336.000.

Toyoda Gosei Co., Ltd.: *See*—
Hashiba, Takahiro; and Kaga, Kouichi, 5,067,367, Cl. 74-552.000.

Toyoshima, Yoshiki: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,068,283, Cl. 525-64.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kato, Nobuyuki; Habuchi, Ryoji; Morisawa, Kunio; and Itoh, Hiroshi, 5,067,603, Cl. 192-0.076.
Kokubo, Kouichi; Tagawa, Shinichi; Kawanishi, Masaki; Sato, Kunihito; Buma, Shuuichi; Yonekawa, Takashi; and Aburaya, Toshio, 5,067,743, Cl. 280-707.000.
Kushi, Naoto; Takaoka, Toshio; and Muramatsu, Motoyasu, 5,067,579, Cl. 180-197.000.
Okumura, Hiroyuki; Kurokawa, Masashi; Namikawa, Akira; and Tanisake, Hiroka, 5,068,281, Cl. 524-753.000.
Otowa, Hidekazu; Okada, Kazuhiro; Sonoda, Hidefumi; and Kaneko, Tadao, 5,067,468, Cl. 123-516.000.
Uchida, Kiyoshi; Noda, Shoji; and Higuchi, Kazuo, 5,068,871, Cl. 373-17.000.
Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,067,465, Cl. 123-489.000.

Trainham, James A.: *See*—
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

Tran, Liem T., to Texas Instruments Incorporated. Junction field effect transistor with bipolar device and method. 5,068,705, Cl. 357-43.000.

Transportation Technologies, Inc.: *See*—
Gresham, Gary E.; and Tucker, Burnis H., 5,068,583, Cl. 318-266.000.

Treder, Wolfgang: *See*—
Schlingmann, Merten; Keller, Reinhold; Wiesner, Matthias; Treder, Wolfgang; and Thiem, Joachim, 5,068,186, Cl. 435-96.000.

Tremper, Henry S., III, to Du Pont de Nemours, E. I., and Company. Non-carbon black containing conductive coating composition. 5,068,063, Cl. 252-518.000.

Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Certain (2-carboxy or 2-propenoic or 2-carbonyl)-3-halo-4,5-dioxy pyridine intermediates and the corresponding 1,4-dihydro-4-pyridones). 5,068,331, Cl. 546-14.000.

Tri/West Systems, Inc.: *See*—
Volk, John F.; and Michaels, Thomas, 5,067,947, Cl. 604-201.000.

Trieselt, Wolfgang: *See*—
Baur, Richard; Gousetis, Charalampos; Trieselt, Wolfgang; Bochnitschek, Werner; and Oftring, Alfred, 5,068,416, Cl. 562-571.000.

TriQuint Semiconductor, Inc.: *See*—
Hayward, Wesley H.; and Taylor, Stewart S., 5,068,621, Cl. 330-253.000.

Trofimenko, Swiatoslaw: *See*—
Webster, James L.; Trofimenko, Swiatoslaw; Resnick, Paul R.; Bruhnke, Douglas W.; Lerou, Jan J.; Manogue, William H.; Manzer, Leo E.; McCann, Elrey L.; Swearingen, Steven H.; Trainham, James A.; and Bonifaz, Cristobal, 5,068,472, Cl. 570-157.000.

Trotta, Robert A.: *See*—
Miller, Gary R.; Borden, Frederick R.; and Trotta, Robert A., 5,067,238, Cl. 30-34.002.

Trowland, Mark G., to Marketmont Pty, Ltd. Cone shaped inflatable bag for lifting a load. 5,067,774, Cl. 298-1.00A.

Troy Lighting, Inc.: *See*—
Shapiro, James; and Zakrzewski, Bogdan, 5,068,772, Cl. 362-365.000.

TRW Nelson BolzenschweiB-Technik GmbH & Co. KG: *See*—
Aubry, Friedhelm, 5,067,632, Cl. 221-266.000.

TRW Vehicle Safety Systems Inc.: *See*—
Ellis, Robert P., 5,067,212, Cl. 24-642.000.

Tsai, Philips: *See*—
Huang, Ali; Tsai, Philips; and Chen, Bonbo, 5,067,681, Cl. 248-442.200.

Tsai, Sheng-Jen, to AT&T Bell Laboratories. Method and apparatus for testing delta-sigma modulators. 5,068,657, Cl. 341-120.000.

Tsai, Wen-Guo. Multiple-purpose assembled playing set. 5,067,706, Cl. 272-85.000.

Tsubone, Kazuyuki: *See*—
Kawamoto, Hideyuki; Ichinohe, Shoji; and Tsubone, Kazuyuki, 5,068,377, Cl. 556-418.000.

Tsubosaki, Kunihiro: *See*—
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.

Tsubota, Takashi, to Oki Electric Industry Co., Ltd. Opto-semiconductor device and method of fabrication of the same. 5,067,809, Cl. 357-17.000.

Tsuchiya, Mikio; Kawase, Shoichi; and Watanabe, Hirofumi, to Honshu Sangyou Kabushiki Kaisha; and Honshu Paper Co., Ltd. Shrink film package having perforated folded strip. 5,067,612, Cl. 206-497.000.

Tsuda, George I.; and Snyder, Dan E., to Hughes Aircraft Company. Adaptive polarization combining system. 5,068,668, Cl. 342-362.000.

Tsuge, Masuo: *See*—
Nose, Kenkichi; Takata, Tadahiko; and Tsuge, Masuo, 5,068,142, Cl. 428-232.000.

Tsuihiji, Yutaka; and Sakayori, Akio, to Tokyo Aircraft Instrument Co., Ltd. Double-feed sheet detection apparatus. 5,067,704, Cl. 271-262.000.

Tsuji, Kiyoshi, to Olympus Optical Co., Ltd. Endoscope photometric apparatus. 5,068,719, Cl. 358-98.000.

Tsuji, Takahiro, to Ricoh Company, Ltd. Distance measuring apparatus having automatic gain control. 5,068,540, Cl. 250-561.000.

Tsukamoto, Keisuke: *See*—
Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,067,465, Cl. 123-489.000.

Tsukiji, Masaaki: *See*—
Ishizuka, Kou; Nishimura, Tetsuharu; Tsukiji, Masaaki; and Ishii, Satoshi, 5,067,813, Cl. 356-351.000.

Tsumura, Ryuichiro; Muraishi, Teruo; Ideda, Keiichi; and Wang, Jin-Kai, to Mitsui Toatsu Chemicals, Inc. Preparation of N-substituted maleimides by use of tin catalysts. 5,068,357, Cl. 548-548.000.

Tsuneoka, Masatoshi: *See*—
Owada, Nobuo; Horiuchi, Mitsuaki; Tsuneoka, Masatoshi; and Taneoka, Tadayuki, 5,068,710, Cl. 357-71.000.

Tsuyuki, Takao; Sato, Shigehiro; and Ootani, Tetsuo, to Toshiba Lighting & Technology Corporation. Printed strip heater. 5,068,517, Cl. 219-543.000.

Tsuzuki, Kenji: *See*—
Kagawa, Takumi; Morooka, Takashi; and Tsuzuki, Kenji, 5,068,336, Cl. 546-302.000.
Tokunaga, Takumi; Watanabe, Hiroyuki; Tsuzuki, Kenji; Someya, Sinzo; Koura, Seigo; and Ito, Mikio, 5,068,365, Cl. 549-496.000.

Tsuzuki, Makoto; Kimbara, Masahiko; Fukuta, Kenji; and Machii, Akihiko, to Three-D Composites Research Corporation. Three-dimensional fabric woven by interlacing threads with rotor driven carriers. 5,067,525, Cl. 139-11.000.

Tsuzuki, Sadachika: *See*—
Kamimura, Kenji; and Tsuzuki, Sadachika, 5,068,795, Cl. 364-449.000.

Tsuzuki, Toru, to Brother Kogyo Kabushiki Kaisha. Data processor for processing original image information into bit map data, having

means for permitting the bit map data to be always stored in varying-capacity memory. 5,068,805, Cl. 395-164.000.

Tu, Li Wei: *See*—
Deppe, Dennis G.; Feldman, Leonard C.; Kopf, Rose F.; Schubert, Erdmann F.; Tu, Li Wei; and Zydzik, George J., 5,068,868, Cl. 372-45.000.

Tuchiya, Kazumichi; Nagashima, Nobuhara; Wasada, Masayoshi; and Suzuki, Akihiro, to Fuji Photo Optical Co., Ltd. System for controlling the aiming direction, focus, zooming, and/or position of a television camera. 5,068,735, Cl. 358-209.000.

Tucker, Burnis H.: *See*—
Gresham, Gary E.; and Tucker, Burnis H., 5,068,583, Cl. 318-266.000.

Tuneberg, Lee H., to American Orthodontics Corporation. Twin tie wing bracket. 5,067,897, Cl. 433-8.000.

Turgeon, Joseph T.: *See*—
Cole, James A.; Roberts, William O.; and Turgeon, Joseph T., 5,068,134, Cl. 427-376.200.

Turner, James M.: *See*—
Nelson, Charles J.; Bheda, Jayendra H.; Rim, Peter B.; and Turner, James M., 5,067,538, Cl. 152-451.000.

Tustison, Randal W.: *See*—
Montanari, Dennis G.; Gentilman, Richard L.; and Tustison, Randal W., 5,067,781, Cl. 359-350.000.

Tutida, Syuniti: *See*—
Itou, Yuuzi; and Tutida, Syuniti, 5,068,552, Cl. 307-494.000.

Twieg, Robert J.: *See*—
Betterton, Kathleen M.; Hinsberg, William D.; Nguyen, Huu T.; Tang, Wing T.; and Twieg, Robert J., 5,068,054, Cl. 252-299.620.

Tyagi, Surendera K.: *See*—
Hall, Lee O.; Zoski, Glenn; and Tyagi, Surendera K., 5,068,088, Cl. 422-52.000.

Tyler, Rex A., to Eaton Indiana, Inc. Recoil spring end retainer. 5,067,451, Cl. 123-185.0BA.

Tyree, William H.: *See*—
Donohoue, Thomas P.; Oertel, Christopher P.; Tyree, William H.; and Valdez, Joe L., 5,067,820, Cl. 374-31.000.

U.R. Engineering Pty., Ltd.: *See*—
Burke, Desmond C., 5,067,314, Cl. 56-330.000.

Uchida, Hiroshi, to Sony Corporation. Hand-writing input apparatus. 5,067,573, Cl. 178-18.000.

Uchida, Ken; Higashi, Michiya; Kihara, Naoko; Shimozawa, Hiroshi; and Yoshizumo, Akira, to Kabushiki Kaisha Toshiba. Semiconductor device encapsulant consisting of epoxy resin composition. 5,068,267, Cl. 523-435.000.

Uchida, Kiyoshi; Noda, Shoji; and Higuchi, Kazuo, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kabushiki Kaisha. Process for synthesizing diamond and apparatus therefor. 5,068,871, Cl. 373-17.000.

Uchida, Tadahiro; Shimamura, Kuniyuki; Nogawa, Hayabu; Saito, Keikichi; and Hara, Minoru, to Kabushiki Kaisha Kubota Seisakusho. Centrifugal separator. 5,067,938, Cl. 494-12.000.

Uchino, Masahide, to Japan Field Company Ltd. Method and apparatus for cleaning object. 5,067,983, Cl. 134-1.000.

Uchiyama, Kenji: *See*—
Yoshida, Susumu; Onishi, Sei; and Uchiyama, Kenji, 5,068,501, Cl. 200-61.58R.

Ueda, Kunihiro: *See*—
Nakayama, Masatoshi; Ueda, Kunihiro; and Okamura, Masatoshi, 5,068,146, Cl. 428-336.000.

Ueda, Makoto; Sakurada, Koichi; Sakurai, Shungo; Yoshioka, Ritsuo; Ogiya, Shunsuke; and Nagano, Mamoru, to Kabushiki Kaisha Toshiba. Fuel assembly for nuclear reactor. 5,068,082, Cl. 376-428.000.

Ueda, Seitaro: *See*—
Nagamatsu, Hiromitsu; and Ueda, Seitaro, 5,067,931, Cl. 474-162.000.

Ueda, Yutaka: *See*—
Isobe, Kazuyuki; Aizawa, Takao; Yamaguchi, Noboru; and Ueda, Yutaka, 5,068,270, Cl. 524-68.000.

Uehara, Kiyohiro: *See*—
Suzuki, Takumi; and Uehara, Kiyohiro, 5,067,796, Cl. 359-88.000.

Uematsu, Nobuyuki: *See*—
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,067,447, Cl. 123-3.000.

Ueno, Tsugio; Sato, Masato; and Mori, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. System for press-fitting parts into workpiece. 5,067,231, Cl. 29-809.000.

Uhlmann Pac-Systeme GmbH & Co. KG: *See*—
Aschaber, Hans; Bailer, Rudolf; Fochler, Fritz; Kleinstauber, Bernd; and Ruf, Reinhold, 5,067,937, Cl. 493-310.000.

Uijttewaal, Arnoldus: *See*—
Naef, Ferdinand; Delay, Francois; and Uijttewaal, Arnoldus, 5,068,452, Cl. 568-442.000.

Uitterlinden, Andreas G.: *See*—
Vijg, Jan; and Uitterlinden, Andreas G., 5,068,176, Cl. 435-6.000.

Ukai, Yasuhiro; Sunata, Tomihisa; Yukawa, Teizou; and Inada, Toshiya, to Hosiden Corporation. Active matrix liquid crystal display device having improved electrostatic discharge protection. 5,068,748, Cl. 359-59.000.

Ukima Colour & Chemicals Mfg. Co., Ltd.: *See*—
Misaizu, Iwao; Hanada, Kazuyuki; Shibuya, Akihiko; and Kuriyama, Katsumi, 5,068,295, Cl. 526-245.000.

Ullman, Edwin F.: *See*—
Gibbons, Ian; Ullman, Edwin F.; and Felgner, Philip L., 5,068,198, Cl. 436-535.000.

Ullman, Timothy J.; and Gambale, Ronald J., to General Electric Company. Blocked amine terminated polycarbonates and products obtained therefrom. 5,068,284, Cl. 525-67.000.

Ulmer, Peter F. Fan blade remover. 5,067,219, Cl. 29-252.000.

Umeda, Toru; Kondo, Hidetaka; and Kato, Kouichi, to Stanley Electric Co., Ltd. Horizontal sighting apparatus for head-lamps. 5,068,769, Cl. 362-61.000.

Umedu, Yoshio: *See*—
Tagami, Shigeru; Umedu, Yoshio; and Niwa, Katsuhito, 5,068,562, Cl. 310-256.000.

Umemoto, Yasunari: *See*—
Yasunaga, Moritoshi; Masuda, Noboru; Todokoro, Hideo; Umemoto, Yasunari; Tanaka, Hirotoshi; and Itoh, Hiroyuki, 5,068,605, Cl. 324-158.00R.

Umezawa, Kazumi, to Asahi Chemical Polyflex Co., Ltd. Process and apparatus for processing easy-opening bag. 5,067,306, Cl. 53-412.000.

Umezawa, Manami: *See*—
Inukai, Sinji; Agata, Mitsuzi; Umezawa, Manami; Horio, Yoshihiro; Ootake, Yasuhiro; Sawaki, Shohei; and Goto, Masayoshi, 5,068,239, Cl. 514-381.000.

Unilever Patent Holdings B.V.: *See*—
Motion, Keith R.; and Newman, Christopher P., 5,068,466, Cl. 568-781.000.

Unilift Corporation: *See*—
Walter, Thomas P., 5,068,034, Cl. 210-232.000.

Union Carbide Chemicals and Plastics Technology Corporation: *See*—
Burgess, Lloyd M.; and Gibson, Charles A., 5,068,329, Cl. 544-402.000.
Burgess, Lloyd M.; and Gibson, Charles A., 5,068,330, Cl. 544-402.000.
Edwards, David N.; Jorgensen, Robert J.; Lee, Kiu H.; and Marcinkowsky, Arthur E., 5,068,489, Cl. 585-524.000.

Union Carbide Industrial Gases Technology Corporation: *See*—
Bikson, Benjamin; Giglia, Salvatore; and Nelson, Joyce K., 5,067,971, Cl. 55-16.000.

Unirac Corp.: *See*—
Gordon, Roger G., 5,067,605, Cl. 194-248.000.

Uniroyal Chemical Company, Inc.: *See*—
Wheeler, Edward L.; Barrows, Franklin H.; and Franko, Robert J., 5,068,271, Cl. 524-100.000.

Unisys Corp.: *See*—
Concannon, David J.; Copenhaver, Gary B.; and Catchpole, Clive E., 5,068,912, Cl. 382-61.000.
Scheuneman, James H.; and Fontaine, Lawrence R., 5,068,782, Cl. 395-425.000.

United Kingdom Atomic Energy Authority: *See*—
Wormald, Malcolm R.; and Thomas, Bruce W., 5,068,532, Cl. 250-270.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Elliott, Charles T.; and White, Anthony M., 5,068,524, Cl. 250-211.00J.

United States of America
Agriculture: *See*—
Lewis, Jack A.; Lumsden, Douglas; Papavizas, George; Hollenbeck, Martha D.; and Walter, James F., 5,068,105, Cl. 424-93.000.
Air Force: *See*—
Carver, Michael W.; and Kolesar, Edward S., Jr., 5,067,985, Cl. 136-255.000.
Froes, Francis H.; Shong, D. Simon; Kim, Young-Won; and Yolton, Frederick C., 5,067,988, Cl. 148-20.300.
Wicks, Michael C.; and Etten, Paul V., 5,068,671, Cl. 343-799.000.
Army: *See*—
Babbitt, Richard W.; Rachlin, Adam; and Koscica, Thomas E., 5,068,627, Cl. 331-99.000.
Murnane, James F., III; and Kuhnle, William G., 5,067,410, Cl. 102-489.000.
Olson, Donald N.; and Huerta, Joseph, 5,067,406, Cl. 102-374.000.
Energy: *See*—
Donohoue, Thomas P.; Oertel, Christopher P.; Tyree, William H.; and Valdez, Joe L., 5,067,820, Cl. 374-31.000.
Iton, Lennox E.; and Maroni, Victor A., 5,068,485, Cl. 585-500.000.
Kasper, Stanley, 5,067,317, Cl. 60-39.050.
Nutt, Gerald L., 5,067,995, Cl. 149-2.000.
Health and Human Services: *See*—
Kovacs, Joseph; Masur, Henry; and Allegra, Carmen, 5,068,253, Cl. 514-553.000.
Interior: *See*—
Constantz, James E., 5,067,272, Cl. 47-27.000.
National Aeronautics and Space Administration: *See*—
Crews, Jeanne L.; and Cour-Palais, Burton G., 5,067,388, Cl. 89-36.020.
Navy: *See*—
Banura, George A., 5,068,596, Cl. 323-351.000.
Higa, Kelvin T., 5,068,370, Cl. 556-19.000.
Kirkpatrick, Thomas I., 5,068,832, Cl. 367-97.000.
Kline, Todd A.; Rosen, Warren A.; Bermingham, William J.; and Alfonsi, Eric A., 5,068,880, Cl. 375-116.000.
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Businger, Joost A., 5,067,356, Cl. 73-863.020.

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Rabalais, J. Wayne, 5,068,535, Cl. 250-309.000.

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Penning, Trevor M.; and Askonas, Leslie J., 5,068,250, Cl. 514-506.000.

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Teetz, Volker; Wissmann, Hans; and Urbach, Hansjorg, 5,068,351, Cl. 548-452.000.

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Veldman, Paul R.: *See*—
Bruning, Gert W.; and Veldman, Paul R., 5,068,573, Cl. 315-209.00R.
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Morris, Anthony F.; Naef, Regula; Escher, Sina; and Velluz, Alain, 5,068,362, Cl. 549-346.000.
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Sugiyama, Kenji, 5,068,722, Cl. 358-105.000.
Vida-Weld Pty. Limited: *See*—
Dick, Ian R.; Henderson, Ian D.; Kimpton, Gordon L.; and Wyatt, David S., 5,068,507, Cl. 219-73.110.
Vigilant, Ltd.: *See*—
Heyche, Albert; Latteur, Alain; and Dekoninck, Philippe, 5,067,674, Cl. 244-190.000.
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Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; Law, Robert W.; and Vincent, Michael T., 5,067,463, Cl. 123-425.000.
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Schaefer, Thomas J.; and Shur, Robert D., 5,068,812, Cl. 364-578.000.
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von Werner, Konrad; and Probst, Anton, to Hoechst Aktiengesellschaft. Process for the preparation of halogenotetrafluoropropionic acid. 5,068,415, Cl. 562-541.000.
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Wacker-Chemie GmbH: *See*—
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Wagner, Alan M., to Quickfire, Inc. Portable target holder. 5,067,683, Cl. 248-545.000.
Wagner, Gebhard: *See*—
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Kitakami, Osamu; Fujiwara, Hideo; Ojima, Kiyotaka; Ogawa, Youichi; and Wakai, Kunio, 5,068,144, Cl. 428-323.000.
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Walden, James V.: *See*—
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Walker, Michael, to Alcatel N.V. Method of and arrangement for linearizing the frequency response of a loudspeaker system. 5,068,903, Cl. 381-96.000.
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Wanalista, Charles. Sports game organization. 5,067,730, Cl. 273-411.000.
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Wang Laboratories, Inc.: *See*—
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Wasada, Masayoshi: *See*—
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Washington University: *See*—
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Washio, Isomi: *See*—
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Watabe, Kumiko: *See*—
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Watanabe, Junji; Naka, Michiro; and Hijikata, Kenji, to Polyplastics Co., Ltd. Resin composition containing smectic liquid crystal. 5,068,052, Cl. 252-299.010.

Watanabe, Kiminori: *See*—
Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Nakagawa, Akio, 5,068,700, Cl. 357-23.800.

Watanabe, Koji: *See*—
Abe, Nobumasa; Kobayashi, Atsushi; Watanabe, Koji; Morishita, Norio; and Tanaka, Yuji, 5,068,684, Cl. 355-27.000.

Watanabe, Kunitoshi: *See*—
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,067,447, Cl. 123-3.000.

Watanabe, Manabu: *See*—
Sasa, Nobumasa; Shimizu, Kunio; and Watanabe, Manabu, 5,068,689, Cl. 355-107.000.

Watanabe, Masahiko: *See*—
Yoshikawa, Shuuichi; Watanabe, Masahiko; Ikeuchi, Michio; Murata, Yasumoto; and Nakano, Takahiko, 5,068,876, Cl. 375-80.000.

Watanabe, Mitsuo: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Ogino, Masayuki; Miyagawa, Hitoshi; Kamata, Toshio; Watanabe, Mitsuo; and Miyashita, Kunihiro, 5,067,653, Cl. 239-18.000.

Watanabe, Tan; Nishino, Hideki; Iwami, Hidefumi; and Tabata, Kuniaki, to Hitachi, Ltd. Document input method and apparatus. 5,068,804, Cl. 395-147.000.

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Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 5,068,282, Cl. 525-61.000.

Watanabe, Yoshiki: *See*—
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,068,266, Cl. 523-336.000.

Watford, Roland S., Jr.: *See*—
Gandy, Carroll E.; and Watford, Roland S., Jr., 5,067,936, Cl. 493-287.000.

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Sobol, John E., 5,067,297, Cl. 52-396.000.

Watterson, Scott R.; Bersonnet, George B.; Dalebout, William T.; and Burk, Michael, to Proform Fitness Products, Inc. Computerized exercise machine. 5,067,710, Cl. 272-129.000.

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Fulton, Forrest F., 5,068,863, Cl. 372-31.000.

Weaver, Max A.; Pruett, Wayner P.; and Hilbert, Samuel D., to Eastman Kodak Company. Triazole methine compounds. 5,068,348, Cl. 548-264.400.

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Weber, Georg: *See*—
Reiffenrath, Volker; Poetsch, Eike; Krause, Joachim; and Weber, Georg, 5,068,053, Cl. 252-299.610.

Weber, Karl-Arnold: *See*—
Pedain, Josef; Kahl, Lothar; and Weber, Karl-Arnold, 5,068,402, Cl. 560-331.000.

Weber, Peter: *See*—
Hesske, Benno; Adnrae, Franz; and Weber, Peter, 5,067,246, Cl. 33-555.400.

Weber, Rainer: *See*—
Block, Hans-Dieter; Lonhoff, Norbert; Makowka, Bernd; Klotz, Helmut; Weber, Rainer; and Spreckelmeyer, Bernhard, 5,068,015, Cl. 204-89.000.

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Weedling, Robert E.; Swallen, William R.; Johnson, Raynor; Wegener, Jack; and Davis, David T. Air chamber type patient mover air pallet with multiple control features. 5,067,189, Cl. 5-81.00R.

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Weedling, Robert E.; Swallen, William R.; Johnson, Raynor; Wegener, Jack; and Davis, David T., 5,067,189, Cl. 5-81.00R.

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Wirth, Lawrence W.; Wegner, Wayne M.; Tomic, Mladomir; Buchko, Raymond; and Natterer, Johann, 5,067,822, Cl. 383-61.000.

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Deeg, Rolf; Wehner, Rainer; Mattersberger, Johann; and Becker, Udo, 5,068,179, Cl. 435-7.920.

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Kellner, Carl S.; Rao, V. N. Mallikarjuna; and Weigert, Frank J., 5,068,473, Cl. 570-176.000.

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Weis, Alexander L.: *See*—
Illig, Carl R.; and Weis, Alexander L., 5,068,345, Cl. 548-230.000.

Weiss, Charles O.: *See*—
Go, Winston S.; Roti, Joseph S.; Lang, Mark G.; and Weiss, Charles O., 5,068,059, Cl. 252-389.530.

Weitnauer, Ronald M.: *See*—
Henneberger, Roy L.; Weitnauer, Ronald M.; and Johnson, Wayne A., 5,067,678, Cl. 248-68.100.

Weitzer, Paul: *See*—
Lepoutre, Etienne; Devaux, Michel; Hirschberg, Bruno; Petio, Franz A.; and Weitzer, Paul, 5,067,693, Cl. 266-44.000.

Welch, M. Bruce: *See*—
Lee, Clifford C.; and Welch, M. Bruce, 5,068,212, Cl. 502-105.000.

Wella Aktiengesellschaft: *See*—
Mager, Herbert; and Braun, Hans-Jurgen, 5,067,966, Cl. 8-405.000.

Weller, Hugo: *See*—
Burger, Wilfried; Nitschke, Werner; Taufer, Peter; and Weller, Hugo, 5,068,640, Cl. 340-438.000.

Wellman, Tim A., to Crown Equipment Corporation. Wire guidance control system. 5,068,790, Cl. 364-424.020.

Wellman, Tim A.: *See*—
Klopfleisch, Kim A.; Wellman, Tim A.; Kaiser, Willard D.; Koenig, Mark J.; Ridgway, Richard W.; Walters, Bobby L.; and Zelinski, Matthew S., 5,068,791, Cl. 364-424.020.

Wennemar, James A.: *See*—
Wolter, Eric H.; and Wennemar, James A., 5,067,375, Cl. 81-9.420.

Wenoka Seastyle - A Div. of Schur, Inc.: *See*—
Collins, Walter W., 5,067,239, Cl. 30-151.000.

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Wolff, Robert, 5,067,535, Cl. 144-286.00R.

Werner, Kurt: *See*—
Hauch, Dennis W.; and Werner, Kurt, 5,067,253, Cl. 34-82.000.

Werner, Paul: *See*—
Van Geel, Jacobus; Magill, Joseph; Werner, Paul; and Hiernaut, Jean-Pol, 5,068,512, Cl. 219-121.600.

Wernquest, Charles A. Combination holder/enclosure for multi-leaf articles, especially newspapers. 5,067,748, Cl. 281-48.000.

Wesner, Francis P. Method of playing a board game. 5,067,722, Cl. 273-248.000.

West, Atwell G. Infant's toy. 5,067,925, Cl. 446-397.000.

West, Lamar E.; Lafay, William P.; Ghanouni, Majid; and Cook, Alex M., Jr., to Scientific Atlanta, Inc. Television signal processing network for subscription television jamming signals. 5,068,893, Cl. 380-7.000.

West Point Pepperell, Inc.: *See*—
Lauderdale, Harold L., 5,068,000, Cl. 156-148.000.

Westeppe, Uwe: *See*—
Horlacher, Peter; Serini, Volker; Freitag, Dieter; Grigo, Ulrich; Idel, Karsten-Josef; and Westeppe, Uwe, 5,068,302, Cl. 528-21.000.

Westinghouse Electric Corp.: *See*—
Clark, William G., Jr., 5,068,608, Cl. 324-220.000.
Impink, Albert J., Jr.; and Lipner, Melvin H., 5,068,080, Cl. 376-215.000.
John, Clarence D., Jr.; and Sparrow, James A., 5,068,083, Cl. 376-449.000.
Rosa, John, 5,068,774, Cl. 363-3.000.

Whaley, John F.: *See*—
Hosmer, Christopher E.; and Whaley, John F., 5,067,214, Cl. 26-89.000.

Wheeler, Bryce A.: *See*—
Cook, Lacy G.; and Wheeler, Bryce A., 5,068,750, Cl. 359-399.000.

Wheeler, Edward L.; Barrows, Franklin H.; and Franko, Robert J., to Uniroyal Chemical Company, Inc. Arylenediamine substituted pyrimidines compositions. 5,068,271, Cl. 524-100.000.

Wheless, Jack C.; Keen, Billy J., Jr.; and Ritt, Renzer R., Sr., to Philip Morris Incorporated. Tube cutting and forming apparatus. 5,067,498, Cl. 131-88.000.

Whirlpool Corporation: *See*—
Hauch, Dennis W.; and Werner, Kurt, 5,067,253, Cl. 34-82.000.

White, Anthony M.: *See*—
Elliott, Charles T.; and White, Anthony M., 5,068,524, Cl. 250-211.00J.

White, Kevin A.: *See*—
Hunter, Dave H.; Lauck, Kenneth L.; White, Kevin A.; Milne, Robert J.; Doolin, Leonard J.; and Poulin, Stephen V., 5,067,875, Cl. 416-114.000.

White, Thayer: *See*—
Clausen, Henrik; Yamamoto, Fumi-ichiro; White, Thayer; and Hakomori, Sen-itiroh, 5,068,191, Cl. 435-193.000.

Whybrow, Derek: *See*—
Jeffery, James E.; and Whybrow, Derek, 5,068,440, Cl. 564-442.000.

Wicher, Jerome, to Atochem North America, Inc. Hindered phenolic N-(amido)imides. 5,068,356, Cl. 548-546.000.

Wickes Manufacturing Company: *See*—
Fischbach, Roderick C., 5,067,768, Cl. 296-107.000.

Wicks, Michael C.; and Etten, Paul V., to United States of America, Air Force. Orthogonally polarized quadraphase electromagnetic radiator. 5,068,671, Cl. 343-799.000.

Wico Distribution Corp.: *See*—
Engel, Raul R., 5,068,498, Cl. 200-6.00A.

Widen, Bo. Cylinder lock and locking tumbler. 5,067,335, Cl. 70-495.000.

Widmann, Dieter: *See*—
Sauter, Willy; Thumm, Helmut; Wahl, Rainer; and Widmann, Dieter, 5,067,371, Cl. 74-813.00L.

Wiedemer, Manfred: *See*—
Frunder, Henning; and Wiedemer, Manfred, 5,067,404, Cl. 101-488.000.

Wiedenbeck, Roger D.: *See*—
Peter, John H.; Timm, Gerald L.; and Wiedenbeck, Roger D., 5,067,824, Cl. 384-99.000.

Wiegand, Ulfried: *See*—
Silbernagel, Hermann; and Wiegand, Ulfried, 5,067,849, Cl. 404-9.000.

Wiesner, Matthias: *See*—
Schlingmann, Merten; Keller, Reinhold; Wiesner, Matthias; Treder, Wolfgang; and Thiem, Joachim, 5,068,186, Cl. 435-96.000.

Wiff, Donald R.: *See*—
Lenke, Gerd M.; and Wiff, Donald R., 5,068,292, Cl. 525-509.000.

Wiggins, Fred R.: *See*—
Lee, Yung N.; and Wiggins, Fred R., 5,067,508, Cl. 137-13.000.

Wilchynski, Ronald. Metal working attachment for portable power tool. 5,067,338, Cl. 72-182.000.

Wild Leitz GmbH: *See*—
Meinert, Norbert; Gelzenleuchter, Dieter; and Franek, Henning, 5,068,209, Cl. 501-30.000.

Wilfong, Debra L.: *See*—
Salaba, Timothy A.; and Wilfong, Debra L., 5,067,886, Cl. 425-145.000.

Wilke, Michaela: *See*—
Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, 5,068,321, Cl. 536-32.000.

Wilkins, Bruce G.; and Helm, Randolf E. Mini blind hold down bracket. 5,067,545, Cl. 160-178.100.

Willford, Sandford R.: *See*—
Robbins, John A.; Zarian, Jamshid J.; and Willford, Sandford R., 5,067,831, Cl. 385-123.000.

William Prym-Werke GmbH & Co. KG: *See*—
Hagmann, Paul; and Greven, Hermann, 5,067,611, Cl. 206-383.000.

Williams, Douglas D.: *See*—
Gillett, Richard B., Jr.; and Williams, Douglas D., 5,068,781, Cl. 395-325.000.

Williams, Joel L.: *See*—
Taylor, Maylon S., II; and Williams, Joel L., 5,067,491, Cl. 128-748.000.

Williams, Michael G.: *See*—
Bhogal, Balbir S.; Williams, Michael G.; and Miller, Glenn A., 5,068,104, Cl. 424-88.000.

Williams, Owen P., to Motorola, Inc. Vacuum wafer transport and processing system and method using a plurality of wafer transport arms. 5,067,218, Cl. 29-25.010.

Williams, William H.; and Jacobs, Paul G. Low cost replaceable type sound dampening unit for vacuum cleaning machine. 5,067,584, Cl. 181-231.000.

Wilson, Keith B.: *See*—
Agrawal, Rakesh; Farrell, Brian E.; and Wilson, Keith B., 5,067,976, Cl. 62-22.000.

Winiger, Werner J.: *See*—
Verhelst, Paulus W. E.; Winiger, Werner J.; and Collard, Rene F. A., 5,068,809, Cl. 395-145.000.

Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG: *See*—
Stemmler, Kurt, 5,067,698, Cl. 270-39.000.

Wirth, Lawrence W.; Wegner, Wayne M.; Tomic, Mladomir; Buchko, Raymond; and Natterer, Johann, to Reynolds Consumer Products, Inc. Method of forming recloseable packages, profiles used therein, and packages produced thereby. 5,067,822, Cl. 383-61.000.

Wise, Donald L.; Augenstein, Don C.; and Gresser, Joseph D., to Northeastern University. Process for manufacture of alkaline earth acetates. 5,068,188, Cl. 435-140.000.

Wiseman, William A., to Polysar Rubber Corporation. Plasticized hydrogenated nitrile rubber. 5,068,275, Cl. 524-314.000.

Wisne, Lawrence A.: *See*—
Schlatter, Howard M.; and Wisne, Lawrence A., 5,067,606, Cl. 198-465.100.

Wissmann, Hans: *See*—
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Witco Corporation: *See*—
Karalis, Anastasios; Morong, Thomas; and Juszkiewicz, Charles, 5,068,431, Cl. 564-301.000.

Witte, James R., to General Electric Company. Shaft torque measurement. 5,067,355, Cl. 73-862.340.

Witzel, Bruce E.: *See*—
Tischler, Allan N.; Durette, Philippe L.; Witzel, Bruce E.; Rupprecht, Kathleen M.; Gallagher, Timothy F.; Goldenberg, Marvin M.; and Allison, Debra L., 5,068,248, Cl. 514-443.000.

Wojtech, Bernhard: *See*—
Miess, Georg-Emerich; Schwarz, Karl-Heinz; Tetzlaff, Heribert; and Wojtech, Bernhard, 5,068,358, Cl. 548-555.000.

Wolf, Hubert: *See*—
Fischer, Joachim; and Wolf, Hubert, 5,068,038, Cl. 210-662.000.

Wolff, Robert, to Werkzeug-gesellschaft mit beschranter Haftung. Worktable. 5,067,535, Cl. 144-286.00R.

Wolff Walsrode Aktiengesellschaft: *See*—
Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, 5,068,321, Cl. 536-32.000.

Wolter, Eric H.; and Wennemar, James A., to Ideal Industries, Inc. Power operated wire stripper. 5,067,375, Cl. 81-9.420.

Won, Song, to Samsung Electron Devices Co., Ltd. Electroluminescent element. 5,068,157, Cl. 428-690.000.

Woodard, Ollie C., Sr.: *See*—
Smith, Lawrence N.; Woodard, Ollie C., Sr.; and Herrell, Dennis J., 5,068,580, Cl. 315-366.000.

Woodgate, Terence A., to GTE Rotaflex Limited. Electric current distribution apparatus. 5,067,906, Cl. 439-115.000.

Woodroffe, Brian W., to Hewlett-Packard Company. Monitoring of digital transmission systems. 5,068,879, Cl. 375-115.000.

Woodruff, Robert A.: *See*—
Petigara, Ramesh B.; Leister, Norman A.; Pendell, Barry J.; and Woodruff, Robert A., 5,068,344, Cl. 548-213.000.

Woog, Philippe-Guy E.; and Moret, Michel A., to Les Produits Associes LPA-Broxo S.A. Stimulator. 5,067,480, Cl. 128-32.000.

Worgotter, Herbert: *See*—
Theurer, Josef; and Worgotter, Herbert, 5,067,412, Cl. 104-16.000.

Wormald, Malcolm R.; and Thomas, Bruce W., to United Kingdom Atomic Energy Authority. Analysis using neutrons. 5,068,532, Cl. 250-270.000.

Wormser Company, The: *See*—
Wormser, Walter S., 5,067,179, Cl. 2-269.000.

Wormser, Walter S., to Wormser Company, The. Convertible garment leg construction. 5,067,179, Cl. 2-269.000.
Worrell, Dean A.: *See—*
Kyrtsos, Christos T.; and Worrell, Dean A., 5,067,572, Cl. 177-139.000.
Wright, David L.: *See—*
Abbott, Rexford J.; and Wright, David L., 5,068,861, Cl. 372-20.000.
Wright, John J.: *See—*
Sit, Sing-Yuen; and Wright, John J., 5,068,346, Cl. 548-253.000.
Wright, Michael E., to National Semiconductor Corporation. Piecewise current source whose output falls as control voltage rises. 5,068,593, Cl. 323-315.000.
Wright, Tommy T.: *See—*
Jones, Mark G.; and Wright, Tommy T., 5,067,650, Cl. 232-17.000.
Wu, Chih-Cheng. Built-up cup rack. 5,067,619, Cl. 211-71.000.
Wu, Margaret M.; and Ho, Suzzy C., to Mobil Oil Corporation. Lubricant oligomers of C_2–C_5 olefins. 5,068,476, Cl. 585-12.000.
Wyatt, David S.: *See—*
Dick, Ian R.; Henderson, Ian D.; Kimpton, Gordon L.; and Wyatt, David S., 5,068,507, Cl. 219-73.110.
Wynn, David K.; and Brown, Omar L., to Dayton Reliable Tool & Mfg. Co. Transfer plate lifts for shell press. 5,067,341, Cl. 72-426.000.
Wyvratt, Matthew J., Jr.; Beattie, Thomas R.; Ok, Hyun; Arison, Byron H.; and Fisher, Michael H., to Merck & Co., Inc. Thermally rearranged FK-506 derivatives having immunosuppressant activity. 5,068,323, Cl. 540-456.000.
Xerox Corporation: *See—*
Fisher, Almon P., 5,068,006, Cl. 156-633.000.
Malhotra, Shadi L.; Martins, Maria L.; Stevanovic, Maya D.; and Jones, Arthur Y., 5,068,140, Cl. 428-216.000.
Xilinx, Inc.: *See—*
Mahoney, John E., 5,068,603, Cl. 324-158.00R.
Y&B Investment Corporation: *See—*
Zuck, Daniel R., 5,067,668, Cl. 244-7.00R.
Yagi, Katsuya, to Konica Corporation. Optical pickup device for reading information on an optical disk. 5,068,845, Cl. 369-112.000.
Yagi, Kiyoshi: *See—*
Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,067,465, Cl. 123-489.000.
Yagi, Soichi: *See—*
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Yagi, Tetsuya; and Hironaka, Misao, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor light emission system. 5,068,870, Cl. 372-50.000.
Yagi, Toshiharu: *See—*
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Yaguchi, Akihiro: *See—*
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Yajima, Yasuhito, to NGK Insulators, LTD. Stress sensor having deformable ceramic hollow member. 5,068,635, Cl. 338-42.000.
Yakhontov, Nikolai E.: *See—*
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Yamada, Hirokazu: *See—*
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Yamada Iryo Shomei Kabushiki Kaisha: *See—*
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Yamada, Kazuhiro; and Ishibashi, Tadao, to Chisso Corporation. Opaque, laminated and stretched products, and method for making them. 5,068,155, Cl. 428-515.000.
Yamada, Koji: *See—*
Nakagawa, Susumu; Ushijima, Ryosuke; Nakano, Fumio; Yamada, Koji; and Mano, Eiichi. 5,068,322, Cl. 540-222.000.
Yamada, Seiji; and Naruke, Kiyomi, to Kabushiki Kaisha Toshiba. Method of applying a program voltage for a non-volatile semiconductor memory and apparatus for implementing the same. 5,068,827, Cl. 365-189.010.
Yamada, Yasuharu: *See—*
Kaji, Masashi; Aramaki, Takanori; Nakahara, Norito; and Yamada, Yasuharu, 5,068,293, Cl. 525-534.000.
Yamade, Yasushi: *See—*
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Yamagishi, Ken: *See—*
Takagawa, Makoto; Yamagishi, Ken; Yoshihara, Jyun; Inamasa, Kenji; and Watabe, Kumiko, 5,068,480, Cl. 585-411.000.
Yamaguchi, Atsuo, to Mitsubishi Denki Kabushiki Kaisha. Non-contact IC card. 5,068,521, Cl. 235-492.000.
Yamaguchi, Kiyoshi: *See—*
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Tanaka, Hiroshi; Ishiwata, Tetsuo; Hitotsumachi, Shuzo; Komae, Hitoshi; Yamaguchi, Susumu; Yoshino, Tadashi; and Yamauchi, Eiji, 5,068,752, Cl. 360-32.000.
Yamaguchi, Yasunori; and Miyake, Jun, to Hitachi, Ltd. Semiconductor memory device. 5,068,829, Cl. 365-189.070.
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Yamaguchi, Yoshiyuki: *See—*
Higuchi, Toshihiko; Nakano, Yasuhiko; Kunii, Nobuaki; Yamaguchi, Yoshiyuki; and Kozawa, Shigeyuki, 5,068,304, Cl. 528-28.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Kobayashi, Noboru, 5,067,427, Cl. 114-56.000.
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Yamamoto, Fumi-ichiro: *See—*
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Yamamoto, Junji: *See—*
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Yamamoto, Shosaku; and Kakinuma, Kazuo, to Nippon Oil and Fats Co., Ltd. Primer compositions. 5,068,287, Cl. 525-124.000.
Yamamoto, Takemi; and Ishikawa, Shigeo, to Brother Kogyo Kabushiki Kaisha. Printing apparatus. 5,067,835, Cl. 400-582.000.
Yamamura, Akira, to Nippon Ferrofluidics Corporation. Magnetic bearing device. 5,068,558, Cl. 310-90.500.
Yamamuro, Takao: *See—*
Kokubo, Tadashi; Yamamuro, Takao; and Abe, Yoshio, 5,068,122, Cl. 427-2.000.
Yamanaka, Mitsuaki, to Chuo Packaging Machinery Co., Ltd. Raw material supply device at a stow-packaging machine. 5,067,310, Cl. 53-551.000.
Yamane, Manabu: *See—*
Kubota, Hitoshi; Yamane, Manabu; and Anezaki, Takashi, 5,068,588, Cl. 318-640.000.
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Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, to Fujitsu Ten Limited; and Toyota Jidosha Kabushiki Kaisha. Lean burn internal combustion engine. 5,067,465, Cl. 123-489.000.
Yamashita, Kouji, to Sharp Kabushiki Kaisha. Cordless telephone capable of programming an ID code into both a base and cordless remote unit via the cordless remote unit. 5,068,889, Cl. 379-62.000.
Yamashita, Mikio: *See—*
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Yamauchi, Eiji: *See—*
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Yamazaki, Hitoshi, to Casio Electronics Manufacturing; and Casio Computer Co. Ltd. Image memory circuit for use in a rotation of image data. 5,068,904, Cl. 382-46.000.
Yamazaki, Takashi: *See—*
Murakami, Gen; Tsubosaki, Kunihiro; Ichitani, Masahiro; Nishi, Kunihiko; Anjo, Ichiro; Nishimura, Asao; Kitano, Makoto; Yaguchi, Akihiro; Kawai, Sueo; Ogata, Masatsugu; Eguchi, Syuuji; Kokaku, Hiroyoshi; Segawa, Masanori; Hozoji, Hiroshi; Yokoyama, Takashi; Kinjo, Noriyuki; Kaneda, Aizo; Saeki, Junichi; Nakamura, Shozo; Hasebe, Akio; Kikuchi, Hiroshi; Yoshida, Isamu; Yamazaki, Takashi; Oshima, Kazuyoshi; and Matsumoto, Tetsuro, 5,068,712, Cl. 357-72.000.
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Yang, Ping; Chatterjee, Amitava; Aur, Shian; and Polgreen, Thomas L., to Texas Instruments Incorporated. Programmable interconnect or cell using silicided MOS transistors. 5,068,696, Cl. 357-23.100.
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Yarger, Ronald G.; Klemann, Lawrence P.; and Finley, John W., to Nabisco Brands, Inc. Amine ester derivatives as low calorie fat mimetics. 5,068,120, Cl. 426-611.000.
Yashina, Kazuo, to Teio Tsushin Kogyo Kabushiki Kaisha. Burglar-proof device. 5,068,643, Cl. 340-571.000.
Yasuda, Shigeyuki. Self-temperature control flexible plane heater. 5,068,518, Cl. 219-549.000.
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Yasunaga, Moritoshi; Masuda, Noboru; Todokoro, Hideo; Umemoto, Yasunari; Tanaka, Hirotoshi; and Itoh, Hiroyuki, to Hitachi, Ltd. Semiconductor integrated circuit device and method of testing the same. 5,068,605, Cl. 324-158.00R.
Yates, Donald N., Jr.; and Myers, William D., Jr., to Baker Hughes Incorporated. Well perforating gun. 5,067,568, Cl. 175-4.520.
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Young, David A.; Jung, John A.; and McLaughlin, Mark L., to Exxon Chemical Patents Inc. Process for preparation of condensed alcohols by alkoxide catalysts. 5,068,469, Cl. 568-878.000.

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Zhadanov, Semen. Injury resistant needle device. 5,067,946, Cl. 604-198.000.

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Zipplies, Matthias; Sauter, Hubert; Roehl, Franz; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Fungicidal N-substituted 3-arylpyrrolidine derivatives. 5,068,245, Cl. 514-429.000.

Zipplies, Matthias; Sauter, Hubert; Himmele, Walter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Fungicidal N-substituted 3-alkyl-4-arylpyrrolidine derivatives. 5,068,246, Cl. 514-429.000.

Zlobinsky, Yury; and Mattes, Donald A., to Savant Instruments, Inc. Vacuum pump with heated vapor pre-trap. 5,067,251, Cl. 34-5.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF NOVEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brauer, Melvin; Downey, William J.; Naughton, Frank C.; and Chao, Jerry C., to CasChem, Inc. Grease compatible extended polyurethanes. Re. 33,754, Cl. 428-380.000.

Brauer, Melvin: *See*—
Downey, William J.; Brauer, Melvin; and Chao, Jerry C., Re. 33,755, Cl. 524-296.000.

CasChem, Inc.: *See*—
Brauer, Melvin; Downey, William J.; Naughton, Frank C.; and Chao, Jerry C., Re. 33,754, Cl. 428-380.000.
Downey, William J.; Brauer, Melvin; and Chao, Jerry C., Re. 33,755, Cl. 524-296.000.

Centro Sviluppo Materiali S.p.A.: *See*—
Vacchiano, Sergio; Lanfranco, Giovanni; and Gubiotti, Roberto, Re. 33,753, Cl. 420-47.000.

Chao, Jerry C.: *See*—
Brauer, Melvin; Downey, William J.; Naughton, Frank C.; and Chao, Jerry C., Re. 33,754, Cl. 428-380.000.
Downey, William J.; Brauer, Melvin; and Chao, Jerry C., Re. 33,755, Cl. 524-296.000.

DeLucia, Frank: *See*—
Geczy, Bela; and DeLucia, Frank, Re. 33,751, Cl. 175-61.000.

Downey, William J.; Brauer, Melvin; and Chao, Jerry C., to CasChem, Inc. Ester plasticizers for polyurethane compositions. Re. 33,755, Cl. 524-296.000.

Downey, William J.: *See*—
Brauer, Melvin; Downey, William J.; Naughton, Frank C.; and Chao, Jerry C., Re. 33,754, Cl. 428-380.000.

Geczy, Bela; and DeLucia, Frank, to Smith International, Inc. System and method for controlled directional drilling. Re. 33,751, Cl. 175-61.000.

Gubiotti, Roberto: *See*—
Vacchiano, Sergio; Lanfranco, Giovanni; and Gubiotti, Roberto, Re. 33,753, Cl. 420-47.000.

Lanfranco, Giovanni: *See*—
Vacchiano, Sergio; Lanfranco, Giovanni; and Gubiotti, Roberto, Re. 33,753, Cl. 420-47.000.

Lee, Noel. Signal cable assembly. Re. 33,750, Cl. 174-115.000.

Naughton, Frank C.: *See*—
Brauer, Melvin; Downey, William J.; Naughton, Frank C.; and Chao, Jerry C., Re. 33,754, Cl. 428-380.000.

Poss, Werner. Apparatus for the separation of mixtures of materials of different consistencies such as meat and bone. Re. 33,752, Cl. 241-74.000.

Smith International, Inc.: *See*—
Geczy, Bela; and DeLucia, Frank, Re. 33,751, Cl. 175-61.000.

Vacchiano, Sergio; Lanfranco, Giovanni; and Gubiotti, Roberto, to Centro Sviluppo Materiali S.p.A. Austenitic steel with improved high-temperature strength and corrosion resistance. Re. 33,753, Cl. 420-47.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bayer Aktiengesellschaft: *See*—
Jacobs, Gundolf; Haas, Peter; Illger, Hans-Walter; Kogelnik, Hans-Joachim; and Wolf, Klaus-Dieter, B1 4,970,243, Cl. 521-155.000.

Bliss, George N.: *See*—
McEvoy, John C.; Bliss, George N.; and Thomas, Leslie P., B1 4,569,444, Cl. 209-510.000.

Bordoni, Maurice E.; and Lieberman, Ephraim, to Cadema Medical Products, Inc. Aerosol inhalation apparatus. B1 4,823,784, 11-26-91, Cl. 128-200.140.

Cadema Medical Products, Inc.: *See*—
Bordoni, Maurice E.; and Lieberman, Ephraim, B1 4,823,784, Cl. 128-200.140.

CRC-Evans Pipeline International, Inc.: *See*—
Layh, Ricky L.; and Landrum, Christy B., Jr., B1 4,633,602, Cl. 37-195.000.

Diamond Automations, Inc.: *See*—
McEvoy, John C.; Bliss, George N.; and Thomas, Leslie P., B1 4,569,444, Cl. 209-510.000.

Haas, Peter: *See*—
Jacobs, Gundolf; Haas, Peter; Illger, Hans-Walter; Kogelnik, Hans-Joachim; and Wolf, Klaus-Dieter, B1 4,970,243, Cl. 521-155.000.

Illger, Hans-Walter: *See*—
Jacobs, Gundolf; Haas, Peter; Illger, Hans-Walter; Kogelnik, Hans-Joachim; and Wolf, Klaus-Dieter, B1 4,970,243, Cl. 521-155.000.

Jacobs, Gundolf; Haas, Peter; Illger, Hans-Walter; Kogelnik, Hans-Joachim; and Wolf, Klaus-Dieter, to Bayer Aktiengesellschaft. Process for the production of flexible slabstock polyurethane foams. B1 4,970,243, 11-26-91, Cl. 521-155.000.

Kogelnik, Hans-Joachim: *See*—
Jacobs, Gundolf; Haas, Peter; Illger, Hans-Walter; Kogelnik, Hans-Joachim; and Wolf, Klaus-Dieter, B1 4,970,243, Cl. 521-155.000.

Landrum, Christy B., Jr.: *See*—
Layh, Ricky L.; and Landrum, Christy B., Jr., B1 4,633,602, Cl. 37-195.000.

Layh, Ricky L.; and Landrum, Christy B., Jr., to CRC-Evans Pipeline International, Inc. Method and apparatus for padding pipe. B1 4,633,602, 11-26-91, Cl. 37-195.000.

Lieberman, Ephraim: *See*—
Bordoni, Maurice E.; and Lieberman, Ephraim, B1 4,823,784, Cl. 128-200.140.

Luke, Roger D.; and Rhodes, John M., to Siemens-Allis, Inc. Panelboard having distributed neutral. B1 4,167,769, 11-26-91, Cl. 361-355.000.

McEvoy, John C.; Bliss, George N.; and Thomas, Leslie P., to Diamond Automations, Inc. Egg processing system. B1 4,569,444, 11-26-91, Cl. 209-510.000.

Rhodes, John M.: *See*—
Luke, Roger D.; and Rhodes, John M., B1 4,167,769, Cl. 361-355.000.

Siemens-Allis, Inc.: *See*—
Luke, Roger D.; and Rhodes, John M., B1 4,167,769, Cl. 361-355.000.

Thomas, Leslie P.: *See*—
McEvoy, John C.; Bliss, George N.; and Thomas, Leslie P., B1 4,569,444, Cl. 209-510.000.

Wolf, Klaus-Dieter: *See*—
Jacobs, Gundolf; Haas, Peter; Illger, Hans-Walter; Kogelnik, Hans-Joachim; and Wolf, Klaus-Dieter, B1 4,970,243, Cl. 521-155.000.

LIST OF DESIGN PATENTEES

A.M.K. Investments Ltd.: *See—*
Kraus, Arthur M., 321,786, Cl. D3-65.000.
Kraus, Arthur M., 321,787, Cl. D3-65.000.

Abe, Karl-Heinz; and Gevert, Klaus V., to Bayerische Motoren Werke AG. Motorcycle. 321,849, 11-26-91, Cl. D12-110.000.

Abiney, Hassin A.: *See—*
Brenda, Beverly J.; Abiney, Hassin A.; and McDiarmid, Roger, 321,878, Cl. D14-191.000.

Adams, Duane D., to North American Philips Corp. Coffee maker. 321,807, 11-26-91, Cl. D7-309.000.

Aktiebolaget Volvo: *See—*
Falck, Stig F. O.; and Falck, Frans G., 321,946, Cl. D26-35.000.
Malmgren, Rolf A.; and Falck, Frans G., 321,943, Cl. D26-28.000.
Malmgren, Rolf A.; and Falck, Frans G., 321,944, Cl. D26-28.000.

Alcan Aluminum Limited: *See—*
Zobrist, Peter, 321,809, Cl. D7-359.000.

Alliance Telecommunications Corp.: *See—*
Metivier, Donald E., 321,886, Cl. D14-238.000.

Alterbaum, Reinold. Motor-driven golf-bag caddy. 321,964, 11-26-91, Cl. D34-15.000.

AMC International Alfa Metalcraft Corporation AG: *See—*
Schultz, Horst, 321,810, Cl. D7-363.000.

American Design Group, Inc.: *See—*
Blum, Marvin D., 321,800, Cl. D6-472.000.

American Standard Inc.: *See—*
Enthoven, Axel, 321,950, Cl. D26-92.000.

Anderson, Curt, to Gold Star Co., Ltd. Facsimile. 321,867, 11-26-91, Cl. D14-118.000.

Anderson, Curt, to Gold Star Co., Ltd. Facsimile. 321,868, 11-26-91, Cl. D14-118.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone. 321,871, 11-26-91, Cl. D14-151.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone. 321,872, 11-26-91, Cl. D14-151.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone. 321,873, 11-26-91, Cl. D14-151.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone. 321,874, 11-26-91, Cl. D14-151.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone. 321,875, 11-26-91, Cl. D14-151.000.

Appelbaum, Paul. Shackleless padlock. 321,824, 11-26-91, Cl. D8-334.000.

Apple Computer, Inc.: *See—*
Ross, Grant D., Jr., 321,855, Cl. D13-107.000.

Arndt, Robert: *See—*
Polansky, Edwin H.; and Arndt, Robert, 321,833, Cl. D10-30.000.

Asakawa, Nobuyuki: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Asakawa, Nobuyuki, 321,858, Cl. D13-147.000.
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Asakawa, Nobuyuki, 321,860, Cl. D13-147.000.

Asics Corporation: *See—*
Kawasaki, Toshiaki, 321,777, Cl. D2-320.000.

AT&T Bell Laboratories: *See—*
Beecher, Robert L., II; Grewe, Anthony J.; Marks, Jonathan A.; McGarvey, John N.; Vining, Louis D.; and Zambelli, Michael P., 321,870, Cl. D14-130.000.

Attwood Corporation: *See—*
Whitley, Warwick M., II; and Kusiak, James L., 321,856, Cl. D13-119.000.

Austin, Arnold S., to Quabaug Corporation. Bottom and periphery of a footwear unit sole. 321,778, 11-26-91, Cl. D2-320.000.

Aylott, David H., to Eylure Limited. Fingernail repair device. 321,954, 11-26-91, Cl. D28-57.000.

Baby Trend, Inc.: *See—*
Mong-Hsing, Chai, 321,850, Cl. D12-129.000.

Barcanic, Timothy J. Sandal. 321,775, 11-26-91, Cl. D2-293.000.

Barrett, David. Antenna. 321,884, 11-26-91, Cl. D14-234.000.

Bartley, Harold D.; and Gaiser, William R., to Broadway Companies, Inc. Bottle. 321,827, 11-26-91, Cl. D9-370.000.

Basore, Charles W.; and Gilbert, Robert W. Children's playground slide. 321,922, 11-26-91, Cl. D21-244.000.

Bausch & Lomb Incorporated: *See—*
Ramp, Robert H., 321,895, Cl. D16-102.000.

Baxter Diagnostics Inc.: *See—*
D'Aquino, Michael; Rao, Manjeshwar S.; and Kirchick, Howard J., 321,940, Cl. D24-226.000.

Bayerische Motoren Werke AG: *See—*
Abe, Karl-Heinz; and Gevert, Klaus V., 321,849, Cl. D12-110.000.

Bean, W. Edward. Table top novelty. 321,841, 11-26-91, Cl. D11-131.000.

Beecher, Robert L., II; Grewe, Anthony J.; Marks, Jonathan A.; McGarvey, John N.; Vining, Louis D.; and Zambelli, Michael P., to AT&T Bell Laboratories. Video telephone set. 321,870, 11-26-91, Cl. D14-130.000.

Blaisdell, Ronald G.; and Pai, Robert Y., to GTE Products Corporation. Fluorescent lamp holder or the like. 321,857, 11-26-91, Cl. D13-136.000.

Blanchard, Robert G. Physical exercise platform. 321,918, 11-26-91, Cl. D21-191.000.

Blum, Marvin D., to American Design Group, Inc. Display case. 321,800, 11-26-91, Cl. D6-472.000.

Boesch, Timothy J.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 321,889, Cl. D15-17.000.

Bond, Treva. Game piece or similar. 321,916, 11-26-91, Cl. D21-51.000.

Bonner, Yong S. Portable sun protector. 321,924, 11-26-91, Cl. D21-253.000.

Boone, Jack M.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 321,889, Cl. D15-17.000.

Borchardt, Robert L., to Recoton Corporation. Antenna. 321,883, 11-26-91, Cl. D14-230.000.

Bowdler, Michael A., to Hall China Company, The. Sugar packet holder. 321,815, 11-26-91, Cl. D7-560.000.

Brady, Mark D. Support base for a desk set or similar article. 321,908, 11-26-91, Cl. D19-97.000.

Brady, Mark D. Support base for a desk set or similar article. 321,909, 11-26-91, Cl. D19-97.000.

Brady, Mark D. Support base for a desk set or similar article. 321,910, 11-26-91, Cl. D19-97.000.

Brady, Mark D. Support base for a desk set or similar article. 321,911, 11-26-91, Cl. D19-97.000.

Braun Aktiengesellschaft: *See—*
Littmann, Ludwig, 321,811, Cl. D7-379.000.

Brenda, Beverly J.; Abiney, Hassin A.; and McDiarmid, Roger. Combined pager and magnetic key. 321,878, 11-26-91, Cl. D14-191.000.

Bridgestone/Firestone, Inc.: *See—*
Guspodin, James G., 321,852, Cl. D12-147.000.

Broadway Companies, Inc.: *See—*
Bartley, Harold D.; and Gaiser, William R., 321,827, Cl. D9-370.000.

Brodix, Inc.: *See—*
Brotherton, J. V., 321,888, Cl. D15-5.000.

Brook Design Products Limited: *See—*
Logue, Alan V.; and Divers, William, 321,934, Cl. D23-388.000.

Brotherton, J. V., to Brodix, Inc. Intake manifold. 321,888, 11-26-91, Cl. D15-5.000.

Brown, Tobias; and Siegal, Burton L., to Sellstrom Manufacturing Company. Face shield. 321,957, 11-26-91, Cl. D29-9.000.

Brunelle, Virginia: *See—*
Evans, Nancy L.; Dipko, Kathleen; Hudson, Daisy L.; and Brunelle, Virginia, 321,917, Cl. D21-171.000.

Bryant, William C., to Empire Brushes, Inc. Push broom. 321,793, 11-26-91, Cl. D4-135.000.

Buckley, Robert S. Shopping cart holder. 321,798, 11-26-91, Cl. D6-462.000.

Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., to Murray Ohio Manufacturing Company, The. Grass collecting cart for a riding lawn mower. 321,889, 11-26-91, Cl. D15-17.000.

Burt, Cheryl L. Baby bottle holder. 321,938, 11-26-91, Cl. D24-199.000.

Butzko, Betty: *See—*
Montagnino, James G.; Butzko, Betty; Santhouse, Daniel; Hanlon, Tim; and Power, Steve, 321,952, Cl. D28-35.000.

Cabot Safety Corporation: *See—*
Salce, Arthur J.; and Metcalfe, Richard T., 321,958, Cl. D29-16.000.

Cain, Ann S., to 'totes', incorporation. Umbrella handle. 321,780, 11-26-91, Cl. D3-12.000.

Cain, Ann S., to 'totes', incorporated. Umbrella handle. 321,781, 11-26-91, Cl. D3-12.000.

Cain, Ann S., to 'totes', incorporated. Umbrella handle. 321,782, 11-26-91, Cl. D3-12.000.

Callaway Golf Company: *See—*
Parente, Richard E.; De La Cruz, Richard; and Helmstetter, Richard C., 321,920, Cl. D21-220.000.

Casablanca Fan Company, Inc.: *See—*
Ignon, Alexander B., 321,935, Cl. D23-413.000.

Chaney, David B., to EBCO Manufacturing Company. Drinking water dispenser or similar article. 321,806, 11-26-91, Cl. D7-308.000.

Chap, John P.; and Greenberg, Dorothy, to Selfix, Inc. Hook. 321,794, 11-26-91, Cl. D6-323.000.

Chase, David O.; Lynch, Peter F.; Maloney, Martin V.; and Oslecki, Scott W., to General Signal Corporation. Combined locomotive console and master controller cover. 321,853, 11-26-91, Cl. D12-192.000.

Chen, Ching-Ti, to Information Clock Industry Co., Ltd. Three-side clock. 321,832, 11-26-91, Cl. D10-14.000.

Chen, Pi-Chi. Tool box. 321,788, 11-26-91, Cl. D3-74.000.

Cheng, Michael H. L. Golf club head. 321,919, 11-26-91, Cl. D21-220.000.

Chepaitis, Elia V. Alphanumeric font. 321,903, 11-26-91, Cl. D18-26.000.

CJC Holdings, Inc.: *See—*
Waugh, J. T.; and Davis, Parke, 321,840, Cl. D11-33.000.

Cole, Theodore J.; and Swartzendruber, Ray E., to CTB, Inc. Feeder for poultry. 321,959, 11-26-91, Cl. D30-121.000.

Compaq Computer Corporation: *See—*
Kasee, Kimberly W.; Pankonien, Gary W.; and Goodrich, Donald S., 321,898, Cl. D18-55.000.
Cook, Stuart A.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 321,889, Cl. D15-17.000.
Cooper, Richard N.: *See—*
Smith, Lawrence M.; and Cooper, Richard N., 321,927, Cl. D23-231.000.
Croll, Theodore P. Eyeglasses. 321,896, 11-26-91, Cl. D16-102.000.
CTB, Inc.: *See—*
Cole, Theodore J.; and Swartzendruber, Ray E., 321,959, Cl. D30-121.000.
Curtis, Jack M.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 321,889, Cl. D15-17.000.
Dannenberg, Todd D.; and Poulson, Keith L., to Kohler Co. Shower enclosure. 321,929, 11-26-91, Cl. D23-305.000.
D'Aquino, Michael; Rao, Manjeshwar S.; and Kirchick, Howard J., to Baxter Diagnostics Inc. Sample cup for analyzer. 321,940, 11-26-91, Cl. D24-226.000.
Dataproducts Corporation: *See—*
Knox, Edward; and Smith, Philip N., 321,899, Cl. D18-58.000.
Davis, Parke: *See—*
Waugh, J. T.; and Davis, Parke, 321,840, Cl. D11-33.000.
Dawson, Chris R., to Kimberly-Clark Corporation. Tissue or towel dispenser. 321,803, 11-26-91, Cl. D6-518.000.
De La Cruz, Richard: *See—*
Parente, Richard E.; De La Cruz, Richard; and Helmstetter, Richard C., 321,920, Cl. D21-220.000.
Decra Stone, Inc.: *See—*
Lumaban, Nimfa O., 321,967, Cl. D34-44.000.
Delmerico, Paul E.; and Terek, Greg P., to Rubbermaid Commercial Products Inc. Container dolly. 321,965, 11-26-91, Cl. D34-23.000.
Derocher, Michael D., to Hewlett-Packard Company. Electronic notepad for data entry. 321,865, 11-26-91, Cl. D14-100.000.
Dieperink, Menno, to U.S. Philips Corporation. Desk lamp. 321,951, 11-26-91, Cl. D26-107.000.
Dierkes, J. Michael. Dental model trimmer basin or the like. 321,931, 11-26-91, Cl. D23-294.000.
Dinand, Pierre, to International Flavors & Fragrances I.F.F. (France) S.a.r.l. Vaporizer. 321,930, 11-26-91, Cl. D23-360.000.
Dipko, Kathleen: *See—*
Evans, Nancy L.; Dipko, Kathleen; Hudson, Daisy L.; and Brunelle, Virginia, 321,917, Cl. D21-171.000.
Divers, William: *See—*
Logue, Alan V.; and Divers, William, 321,934, Cl. D23-388.000.
Donovan, William P. Baby bottle. 321,936, 11-26-91, Cl. D24-197.000.
Duchess Industries, Inc.: *See—*
Polansky, Edwin H.; and Arndt, Robert, 321,833, Cl. D10-30.000.
During AG: *See—*
During, Walter, 321,828, Cl. D9-370.000.
During, Walter, to During AG. Combined foldable bottle and cap. 321,828, 11-26-91, Cl. D9-370.000.
Duszynski, Ralph E. Air freshener housing. 321,932, 11-26-91, Cl. D23-366.000.
Duz-Mor, Inc.: *See—*
Field, Carl R., 321,893, Cl. D15-122.000.
Eastman Kodak Company: *See—*
Reddig, Alan G., 321,897, Cl. D16-209.000.
EBCO Manufacturing Company: *See—*
Chaney, David B., 321,806, Cl. D7-308.000.
Eide, Ralph M.: *See—*
Foley, John J.; Eide, Ralph M.; and MacDonell, Ranald I., 321,854, Cl. D12-306.000.
Eldon Industries, Inc.: *See—*
Evenson, Mel, 321,912, Cl. D19-99.000.
Emmerling, Ronald, to Gemini Industries Inc. Stereo radio. 321,879, 11-26-91, Cl. D14-192.000.
Emmerling, Ronald, to Gemini Industries Inc. Stereo radio. 321,880, 11-26-91, Cl. D14-192.000.
Empire Brushes, Inc.: *See—*
Bryant, William C., 321,793, Cl. D4-135.000.
Encon Industries, Inc.: *See—*
Markwardt, Herbert W.; and Markwardt, Michael A., 321,933, Cl. D23-377.000.
Enthoven, Axel, to American Standard Inc. Wall-mounted light fixture or the like. 321,950, 11-26-91, Cl. D26-92.000.
Evans, Nancy L.; Dipko, Kathleen; Hudson, Daisy L.; and Brunelle, Virginia. Patch quilt doll. 321,917, 11-26-91, Cl. D21-171.000.
Evenson, Mel, to Eldon Industries, Inc. Paper tray cover. 321,912, 11-26-91, Cl. D19-99.000.
Eylure Limited: *See—*
Aylott, David H., 321,954, Cl. D28-57.000.
Falck, Frans G.: *See—*
Falck, Stig F. O.; and Falck, Frans G., 321,946, Cl. D26-35.000.
Malmgren, Rolf A.; and Falck, Frans G., 321,943, Cl. D26-28.000.
Malmgren, Rolf A.; and Falck, Frans G., 321,944, Cl. D26-28.000.
Falck, Stig F. O.; and Falck, Frans G., to Aktiebolaget Volvo. Rear light for an automobile. 321,946, 11-26-91, Cl. D26-35.000.
Field, Carl R., to Duz-Mor, Inc. Device for repairing and strengthening vehicles. 321,893, 11-26-91, Cl. D15-122.000.
Foley, John J.; Eide, Ralph M.; and MacDonell, Ranald I. Pedal operated water cycle. 321,854, 11-26-91, Cl. D12-306.000.
Forrand, George W. Mobile seat for garden weeding. 321,796, 11-26-91, Cl. D6-330.000.
Frenkler, Friedrich F.: *See—*
Ono, Masayuki; Suzuki, Akira; Uchibori, Noritaka; and Frenkler, Friedrich F., 321,902, Cl. D18-49.000.
Friedman, Frank A., to Herman Miller, Inc. Modules shelf unit. 321,801, 11-26-91, Cl. D6-492.000.
Fujimoto, Takanobu: *See—*
Kumatani, Hiroshi; Yamauchi, Satomi; and Fujimoto, Takanobu, 321,891, Cl. D15-72.000.
Fuller, John M., to Rubbermaid Commercial Products Inc. Stable cart lid. 321,966, 11-26-91, Cl. D34-27.000.
Fushiya, Fusao; and Haneda, Koji, to Makita Electric Works, Ltd. Tree pruner. 321,816, 11-26-91, Cl. D8-7.000.
Gaiser, William R.: *See—*
Bartley, Harold D.; and Gaiser, William R., 321,827, Cl. D9-370.000.
Garrity Industries, Inc.: *See—*
Garrity, Kevin S., 321,785, Cl. D3-63.000.
Garrity, Kevin S., to Garrity Industries, Inc. Combined key holder and flashlight. 321,785, 11-26-91, Cl. D3-63.000.
Gemini Industries Inc.: *See—*
Emmerling, Ronald, 321,879, Cl. D14-192.000.
Emmerling, Ronald, 321,880, Cl. D14-192.000.
General Signal Corporation: *See—*
Chase, David O.; Lynch, Peter F.; Maloney, Martin V.; and Oslecki, Scott W., 321,853, Cl. D12-192.000.
Gevert, Klaus V.: *See—*
Abe, Karl-Heinz; and Gevert, Klaus V., 321,849, Cl. D12-110.000.
Gilbert, Robert W.: *See—*
Basore, Charles W.; and Gilbert, Robert W., 321,922, Cl. D21-244.000.
Gillette Company, The: *See—*
Gray, Michael J., 321,953, Cl. D28-48.000.
Gold Star Co., Ltd.: *See—*
Anderson, Curt, 321,867, Cl. D14-118.000.
Anderson, Curt, 321,868, Cl. D14-118.000.
Golden, Scott M.: *See—*
Wennemar, James A.; and Golden, Scott M., 321,861, Cl. D13-150.000.
Goodrich, Donald S.: *See—*
Kasee, Kimberly W.; Pankonien, Gary W.; and Goodrich, Donald S., 321,898, Cl. D18-55.000.
Gordecki, Richard J.: *See—*
Scheid, William J.; and Gordecki, Richard J., 321,877, Cl. D14-191.000.
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Greenberg, Dorothy: *See—*
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Kraus, Arthur M., to A.M.K. Investments Ltd. Key holder. 321,787, 11-26-91, Cl. D3-65.000.
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Nys, Peter. Football helmet sports figure. 321,845, 11-26-91, Cl. D11-157.000.

Nys, Peter. Basketball hoop and basketball sports figure. 321,846, 11-26-91, Cl. D11-157.000.

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ISSUED NOVEMBER 26, 1991

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19 R 5,068,500
61.45 M 5,068,502
61.58 R 5,068,501
83 L 5,068,503
85 R 5,068,504
525 5,068,505
526 5,068,506

CLASS 202

99 5,068,010

CLASS 203

58 5,068,011

CLASS 204

8 5,068,012
24 5,068,013
59 M 5,068,014
89 5,068,015
145 R 5,068,017
180.1 5,068,018
182.8 5,068,019
192.11 5,068,020
192.14 5,068,021
192.15 5,068,022
196 5,068,023

CLASS 206

45.11 5,067,609
315.1 5,067,610
383 5,067,611
497 5,067,612

CLASS 208

13 5,068,024
57 5,068,025
125 5,068,026
5,068,027

CLASS 209

3.1 5,067,616
167 5,068,028
510 B1 4,569,444

CLASS 210

95 5,068,030
96.1 5,068,031
5,068,032
169 5,068,033
232 5,068,034
236 5,068,035
284 5,068,029
606 5,068,036
638 5,068,037
662 5,068,038
695 5,068,039
748 5,068,040

CLASS 211

13 5,067,617
5,067,618
71 5,067,619
113 5,067,620
117 5,067,621

CLASS 215

1 C 5,067,622
227 5,067,623
235 5,067,624

CLASS 219

73.11 5,068,507
85.16 5,068,508
5,068,509
5,068,510
98 5,068,511
121.6 5,068,512
121.67 5,068,513
121.69 5,068,514
121.73 5,068,515
388 5,068,516
543 5,068,517
549 5,068,518

CLASS 220

343 5,067,625
475 5,067,626

CLASS 221

36 5,067,627
52 5,067,628
70 5,067,629
76 5,067,630
254 5,067,631
266 5,067,632
279 5,067,633
298 5,067,634

CLASS 222

103 5,067,635
105 5,067,636
175 5,067,637
205 5,067,638
521 5,067,639

CLASS 224

42.07 5,067,640
042.03 B 5,067,641
192 5,067,642
197 5,067,643
324 5,067,644

CLASS 225

93 5,067,645

CLASS 226

015 5,067,646

CLASS 228

5.5 5,067,647
47 5,067,648
107 5,067,649

CLASS 229

123.1 5,067,614
214 5,067,613
230 5,067,615

CLASS 232

17 5,067,650

CLASS 235

449 5,068,519
462 5,068,520
492 5,068,521

CLASS 236

15 A 5,067,651

CLASS 237

81 5,067,652

CLASS 239

18 5,067,653
124 5,067,654
5,067,655
290 5,067,656
403 5,067,657
533.8 5,067,658

CLASS 241

19 5,067,659
36 5,067,666
37 5,067,660
55 5,067,661
56 5,067,662
74 Re.33,752

CLASS 242

56 R 5,067,663
67.2 5,067,664
118.32 5,067,665

CLASS 244

1 R 5,067,667
7 R 5,067,668
114 R 5,067,669
119 5,067,670
122 AH 5,067,671
158 R 5,067,672
165 5,067,673
190 5,067,674

CLASS 248

48.2 5,067,675
56 5,067,676
68.1 5,067,677
5,067,678
75 5,067,679
311.3 5,067,680
442.2 5,067,681
453 5,067,682
545 5,067,683
550 5,067,684
676 5,067,685

CLASS 249

57 5,067,686

CLASS 250

206.1 5,068,522
208.1 5,068,523
211 J 5,068,524
213 VT 5,068,525
214 R 5,068,526
227.21 5,068,527
231.13 5,068,528
231.18 5,068,529
237 G 5,068,530
269 5,068,531
270 5,068,532
288 5,068,533
5,068,534
309 5,068,535
341 5,068,536
342 5,068,537
472.1 5,068,538
492.2 5,068,539
561 5,068,540
571 5,068,541
573 5,068,542

CLASS 251

129.08 5,067,687
129.18 5,067,688
144 5,067,689
149.8 5,067,690
315 5,067,691

CLASS 252

8.552 5,068,042
25 5,068,044
32.007 E 5,068,045
51.5 A 5,068,046
52 A 5,068,048
57 5,068,049
62.51 5,068,050
051.5 A 5,068,047
162 5,068,051
299.01 5,068,052
299.61 5,068,053
299.62 5,068,054
301.4 R 5,068,055
313.1 5,068,056
373 5,068,057
376 5,068,058
389.53 5,068,059
500 5,068,060
511 5,068,061
518 5,068,062
5,068,063
855.4 5,068,043

CLASS 254

420 5,067,692

CLASS 260

404.5 5,068,064

CLASS 264

1.3 5,068,065
3.3 5,068,066
4.7 5,068,067
23 5,068,068
40.5 5,068,069
41 5,068,070
56 5,068,071
66 5,068,072
205 5,068,073
257 5,068,074
505 5,068,075
511 5,068,076
512 5,068,077
5,068,078
518 5,068,079

CLASS 266

44 5,067,693

CLASS 269

20 5,067,694
21 5,067,695
49 5,067,696

CLASS 270

37 5,067,697
39 5,067,698
55 5,067,699
5,067,700

CLASS 271

7 5,067,701
134 5,067,702
164 5,067,703
262 5,067,704
277 5,067,705

CLASS 272

85 5,067,706
99 5,067,707
118 5,067,708
121 5,067,709
129 5,067,710

CLASS 273

77 A 5,067,711
143 R 5,067,712
149 P 5,067,713
157 R 5,067,714
167 F 5,067,715
176 R 5,067,716
183 B 5,067,717
185 R 5,067,718
213 5,067,719
237 5,067,720
243 5,067,721
248 5,067,722
249 5,067,723
292 5,067,724
302 5,067,725
326 5,067,726
336 5,067,727
411 5,067,730
416 5,067,731
420 5,067,728
450 5,067,729

CLASS 277

11 5,067,732
5,067,733
236 5,067,734

CLASS 279

1 F 5,067,735

CLASS 280

11.2 5,067,736
47.31 5,067,737
204 5,067,738
304 5,067,739
407 5,067,740
419 5,067,741
479.2 5,067,742
707 5,067,743
734 5,067,744
735 5,067,745
763.1 5,067,746
777 5,067,747

CLASS 281

48 5,067,748

CLASS 283

117 5,067,749

CLASS 285

38 5,067,750
105 5,067,751
119 5,067,752
279 5,067,753
319 5,067,754

CLASS 292

33 5,067,755
292 5,067,756
336.3 5,067,757
347 5,067,758

CLASS 293

109 5,067,759
115 5,067,760

CLASS 294

3.5 5,067,761
64.3 5,067,762
65.5 5,067,763

CLASS 296

97.5 5,067,764
97.8 5,067,765
100 5,067,766
5,067,767
107 5,067,768
166 5,067,769

CLASS 297

184 5,067,770
378 5,067,771
452 5,067,772
457 5,067,773

CLASS 298

1 A 5,067,774

CLASS 299

86 5,067,775

CLASS 301

9 TV 5,067,776

CLASS 303

22.6 5,067,777
113 R 5,067,778
114 PN 5,067,779

CLASS 307

91 5,068,543
268 5,068,544
311 5,068,545
443 5,068,547
446 5,068,548
465.1 5,068,549
475 5,068,550
5,068,551
494 5,068,552
605 5,068,553

CLASS 310

12 5,068,554
52 5,068,555
90 5,068,556
5,068,557
90.5 5,068,558
112 5,068,559
125 5,068,560
178 5,068,561
256 5,068,562
261 5,068,563
270 5,068,564
328 5,068,565
5,068,566
332 5,068,567

CLASS 312

193 5,067,780

CLASS 313

474 5,068,568

CLASS 315

3.5 5,068,569
128 5,068,570
205 5,068,571
209 R 5,068,572
5,068,573
225 5,068,574
241 P 5,068,575
291 5,068,576
307 5,068,577
5,068,578
366 5,068,579
5,068,580
370 5,068,581

CLASS 318

254 5,068,582
266 5,068,583
549 5,068,584
569 5,068,585
640 5,068,588
696 5,068,586
771 5,068,587

CLASS 322

7 5,068,589
10 5,068,590
29 5,068,591

CLASS 323

224 5,068,592
314 5,068,594
315 5,068,593
316 5,068,595
351 5,068,596

CLASS 324

77 B 5,068,597
107 5,068,598
158 F 5,068,600
5,068,601
5,068,602
158 R 5,068,599
5,068,603
5,068,604
5,068,605
174 5,068,606
207.16 5,068,607
220 5,068,608
309 5,068,609
312 5,068,610
314 5,068,611
327 5,068,612
379 5,068,613
534 5,068,614
613 5,068,615
627 5,068,616
663 5,068,617
706 5,068,618
715 5,068,619

CLASS 330

2 5,068,620
253 5,068,621
5,068,622
277 5,068,623
293 5,068,624

CLASS 331

1 A 5,068,625
5,068,628
17 5,068,626
99 5,068,627

CLASS 333

1.1 5,068,629
100 5,068,630
181 5,068,631
238 5,068,632

CLASS 335

190 5,068,633

CLASS 338

21 5,068,634
42 5,068,635
49 5,068,636
57 5,068,637
114 5,068,638
179 5,068,639

CLASS 340

438 5,068,640
551 5,068,641
562 5,068,642
571 5,068,643
701 5,068,644
710 5,068,645
725 5,068,646
734 5,068,647
750 5,068,648
793 5,068,649
799 5,068,650
814 5,068,651
815.03 5,068,652
870.37 5,068,653
903 5,068,654
988 5,068,655
989 5,068,656

CLASS 341

120 5,068,657
131 5,068,658
143 5,068,659
5,068,660
5,068,661
161 5,068,662

CLASS 342

20 5,068,663
90 5,068,664
177 5,068,665
192 5,068,666
362 5,068,667
5,068,668

CLASS 343

700 MS 5,068,669
767 5,068,670
799 5,068,671
859 5,068,672
901 5,068,673

CLASS 346

1.1 5,068,674
76 PH 5,068,675
108 5,068,676
5,068,677

CLASS 351

233 5,067,806

CLASS 352

78 R 5,067,807
140 5,067,808

CLASS 354

199 5,068,678
271.1 5,068,679
286 5,068,680
299 5,068,681
402 5,068,682
484 5,068,683

CLASS 355

27 5,068,684
32 5,068,685
5,068,686
45 5,068,687
99 5,068,688
107 5,068,689
218 5,068,690
259 5,068,691
284 5,068,692
315 5,068,693

CLASS 356

73.1 5,067,810
121 5,067,811
237 5,067,812
339 5,067,814
345 5,067,815
351 5,067,813
373 5,067,816
376 5,067,817

CLASS 357

5 5,068,694
16 5,068,695
5,068,756
17 5,067,809
23.1 5,068,696
23.5 5,068,697
23.6 5,068,698
23.7 5,068,699
23.8 5,068,700
24 5,068,701
35 5,068,702
36 5,068,703
38 5,068,704
43 5,068,705
51 5,068,706
59 5,068,707
68 5,068,708
71 5,068,709
5,068,710
5,068,711
72 5,068,712
5,068,713
80 5,068,714
81 5,068,715

CLASS 358

13 5,068,716
17 5,068,717
27 5,068,718
98 5,068,719
100 5,068,720
5,068,721
105 5,068,722
133 5,068,723
5,068,724
135 5,068,725
5,068,726
138 5,068,727
141 5,068,728
5,068,729
169 5,068,730
180 5,068,731
5,068,732
181 5,068,733
191.1 5,068,734
209 5,068,735
213.13 5,068,736
227 5,068,737
5,068,738
237 5,068,739
241 5,068,740
296 5,068,741
5,068,742
304 5,068,743
310 5,068,744
403 5,068,745
443 5,068,746
448 5,068,747

CLASS 359

32 5,067,792
59 5,068,748
76 5,067,797
84 5,067,795
88 5,067,796
93 5,068,749
118 5,068,847
202 5,067,782
235 5,067,805
286 5,067,798
328 5,068,546
350 5,067,781
369 5,067,804
399 5,068,750
490 5,067,799
566 5,068,751
642 5,067,800
666 5,067,801
700 5,067,802
708 5,067,803
824 5,067,794

CLASS 360

32 5,068,752
45 5,068,754
46 5,068,753
72.1 5,068,755
77.130 5,068,757
96.6 5,068,758
103 5,068,759
121 5,068,760
133.0 5,068,761

CLASS 361

225 5,068,762
355 B1 4,167,769
364 5,068,763
386 5,068,764
422 5,068,765
534 5,068,766

CLASS 362

33 5,068,767
61 5,068,768
5,068,769
5,068,770
255 5,068,771
365 5,068,772
386 5,068,773

CLASS 363

3 5,068,774
15 5,068,775
17 5,068,776
97 5,068,777

CLASS 364

138 5,068,778
167.01 5,068,779
406 5,068,787
413.14 5,068,788
419 5,068,789
424.02 5,068,790
5,068,791
424.05 5,068,792
5,068,793
431.05 5,068,794
449 5,068,795
469 5,068,796
478 5,068,797
497 5,068,798
507 5,068,799
5,068,800
526 5,068,810
551.01 5,068,811
572 5,068,813
578 5,068,812
580 5,068,814
713 5,068,815
718 5,068,816
724.16 5,068,817
734 5,068,818
736 5,068,819

CLASS 365

154 5,068,825
170 5,068,826
189.01 5,068,827
5,068,828
189.07 5,068,829
190 5,068,830
203 5,068,831

CLASS 366

46 5,067,818
138 5,067,819

CLASS 367

97 5,068,832
98 5,068,833
135 5,068,834
5,068,835
174 5,068,836

CLASS 368

10 5,068,837
47 5,068,838
93 5,068,839
281 5,068,840

CLASS 369

13 5,068,841
32 5,068,842
44.13 5,068,843
44.16 5,068,844
112 5,068,845
275.1 5,068,846

CLASS 370

85.5 5,068,849
85.6 5,068,848
85.8 5,068,850

CLASS 371

16.1 5,068,851
16.2 5,068,852
16.3 5,068,853
37.1 5,068,854
37.4 5,068,855
37.5 5,068,856
37.7 5,068,857
41 5,068,858
43 5,068,859

CLASS 372

2 5,068,860
20 5,068,861
25 5,068,862
31 5,068,863
32 5,068,864
36 5,068,865
5,068,866
45 5,068,867
5,068,868
5,068,869
50 5,068,870

CLASS 373

17 5,068,871

CLASS 374

31 5,067,820

CLASS 375

1 5,068,872
13 5,068,873
51 5,068,874
78 5,068,875
80 5,068,876
107 5,068,877
111 5,068,878
115 5,068,879
116 5,068,880

CLASS 376

215 5,068,080
261 5,068,081
428 5,068,082
449 5,068,083

CLASS 377

70 5,068,881

CLASS 378

4 5,068,882
86 5,068,883
119 5,068,884
133 5,068,885
164 5,068,886
170 5,068,887

CLASS 379

62 5,068,889
90 5,068,890
91 5,068,891
100 5,068,888
221 5,068,892

CLASS 380

7 5,068,893
23 5,068,894
28 5,068,895

CLASS 381

13 5,068,896
24 5,068,897
29 5,068,898
31 5,068,899
43 5,068,900
68.6 5,068,901
5,068,902
96 5,068,903

CLASS 382

46 5,068,904
47 5,068,905
48 5,068,906
5,068,907
5,068,908
49 5,068,909
50 5,068,910
54 5,068,914
56 5,068,911
61 5,068,912
5,068,913

CLASS 383

36 5,067,821
61 5,067,822

CLASS 384

45 5,067,823
99 5,067,824
5,067,825
492 5,067,826
537 5,067,827

CLASS 385

2 5,067,788
3 5,067,828
8 5,067,829
13 5,067,786
27 5,067,789
38 5,067,785
50 5,067,787
53 5,067,784
60 5,067,783
101 5,067,791
114 5,067,830
123 5,067,831
127 5,067,793

CLASS 392

389 5,068,915

CLASS 395

25 5,068,801
113 5,068,806
115 5,068,807
119 5,068,808
133 5,068,802
145 5,068,809
147 5,068,804
150 5,068,803
164 5,068,805
275 5,068,784
5,068,820
325 5,068,781
5,068,785
425 5,068,782
500 5,068,823
575 5,068,783
700 5,068,780
775 5,068,822
800 5,068,786
5,068,821
5,068,824

CLASS 400

66 5,067,832
213 5,067,833
489 5,067,834
582 5,067,835

CLASS 401

52 5,067,836
107 5,067,837
206 5,067,838
258 5,067,839

CLASS 402

38 5,067,840

CLASS 403

140 5,067,841
265 5,067,842
301 5,067,843
305 5,067,844
344 5,067,845
370 5,067,846
5,067,847
406.1 5,067,848

CLASS 404

9 5,067,849

CLASS 405

92 5,067,850
115 5,067,851
128 5,067,852
182 5,067,853
184 5,067,854
186 5,067,855

CLASS 406

41 5,067,856
181 5,067,857

CLASS 407

114 5,067,858

CLASS 408

1 R 5,067,859

CLASS 409

185 5,067,860
234 5,067,861

CLASS 410

26 5,067,862

CLASS 411

85 5,067,863
344 5,067,864
531 5,067,865

CLASS 414

228 5,067,866
391 5,067,867
510 5,067,868
544 5,067,869
724 5,067,870
786 5,067,871
5,067,872
789.9 5,067,873

CLASS 415

230 5,067,874

CLASS 416

114 5,067,875
219 R 5,067,876
220 R 5,067,877

CLASS 417

312 5,067,878
472 5,067,879
495 5,067,880
498 5,067,881
511 5,067,882

CLASS 418

61.2 5,067,883
63 5,067,884

CLASS 420

47 Re.33,753
443 5,068,084

CLASS 422

1 5,068,085
21 5,068,086
26 5,068,087
52 5,068,088
61 5,068,089
82.02 5,068,090
99 5,068,091
253 5,068,092

CLASS 423

82 5,068,093
109 5,068,094
122 5,068,095
277 5,068,096
592 5,068,097

CLASS 424

9 5,068,098
47 5,068,099
52 5,068,100
71 5,068,101
72 5,068,102
81 5,068,103
88 5,068,104
93 5,068,105
94.3 5,068,106
435 5,068,107
438 5,068,108
441 5,068,109
461 5,068,110
469 5,068,111
495 5,068,112
496 5,068,113

CLASS 425

131.1 5,067,885
145 5,067,886
256 5,067,887
387.1 5,067,888
458 5,067,889
504 5,067,890
533 5,067,891
556 5,067,892
564 5,067,893

CLASS 426

23.1 5,068,116
69 5,068,114
77 5,068,115
511 5,068,117
582 5,068,118
601 5,068,119
611 5,068,120
636 5,068,121

CLASS 427

2 5,068,122
32 5,068,123
39 5,068,124
55 5,068,125
122 5,068,126
230 5,068,130
237 5,068,127
239 5,068,129
240 5,068,131
358 5,068,133
376.2 5,068,134
421 5,068,132
439 5,068,135

CLASS 428

35.7 5,068,136
36.2 5,068,137
36.8 5,068,138
215 5,068,139
216 5,068,140
219 5,068,141
232 5,068,142
241 5,068,143
323 5,068,144
5,068,145
335 5,068,148
336 5,068,146
5,068,147
367 5,068,149
380 Re.33,754
407 5,068,150
5,068,151
408 5,068,152
413 5,068,153
445 5,068,154
515 5,068,155
620 5,068,156
690 5,068,157
694 5,068,158

CLASS 429

16 5,068,159
44 5,068,161
72 5,068,160
116 5,068,162

CLASS 430

9 5,068,171
192 5,068,163
204 5,068,164
5,068,165
256 5,068,166
264 5,068,167
270 5,068,168
313 5,068,169
393 5,068,170
551 5,068,172
567 5,068,173

CLASS 431

208 5,067,894
253 5,067,895

CLASS 433

6 5,067,896
8 5,067,897
75 5,067,898
80 5,067,899
81 5,067,900

CLASS 434

224 5,067,901
276 5,067,902

CLASS 435

5 5,068,174
6 5,068,175
5,068,176
7.2 5,068,178
7.92 5,068,177
5,068,179
5,068,180
13 5,068,181
22 5,068,182

5,068,183
41 5,068,184
69.1 5,068,185
96 5,068,186
106 5,068,187
140 5,068,188
183 5,068,189
190 5,068,190
193 5,068,191
235.1 5,068,192
252.3 5,068,193
252.5 5,068,194
284 5,068,195

CLASS 436

6 5,068,196
66 5,068,197
535 5,068,198

CLASS 437

52 5,068,199
5,068,200
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205 5,068,205
220 5,068,206
231 5,068,207

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73 5,067,904
76 5,067,905
115 5,067,906
135 5,067,907
248 5,067,908
315 5,067,909
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526 5,067,911
578 5,067,912
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620 5,067,915
857 5,067,916
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61 5,067,919

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25 5,067,920
102 5,067,921

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397 5,067,925

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135 5,067,926
136 5,067,927

CLASS 453

17 5,067,928

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39 5,068,916
90 5,068,917
142 5,068,918

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145 5,067,929

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593 5,068,279
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67 5,068,284
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D2—	79	321,774		309	321,807		130.1	321,839			321,872	D19—	6	321,904	D24—	133	321,937
	293	321,775		317	321,808		131	321,841			321,873		36	321,905		197	321,936
	314	321,776		359	321,809		157	321,843			321,874		64	321,906		199	321,938
	320	321,777		363	321,810			321,844			321,875		72	321,907			321,939
		321,778		379	321,811			321,845		164	321,876		97	321,908		226	321,940
D3—	10	321,779		384	321,812			321,846		191	321,877			321,909	D25—	16	321,941
	12	321,780		509	321,813		163	321,842			321,878			321,910		140	321,942
		321,781		536	321,814			321,847		192	321,879			321,911	D26—	28	321,943
		321,782		560	321,815			321,848			321,880		99	321,912			321,944
	35	321,783	D8—	7	321,816	D12—	110	321,849			321,881	D20—	27	321,913		35	321,945
	56	321,784		14	321,817		129	321,850		196	321,882		43	321,914			321,946
	63	321,785		57	321,818			321,851		230	321,883	D21—	48	321,915			321,947
	65	321,786		70	321,819		147	321,852		234	321,884		51	321,916		65	321,948
		321,787		99	321,820		192	321,853		238	321,886		171	321,917		74	321,949
	74	321,788			321,821		306	321,854		253	321,885		191	321,918		92	321,950
	75	321,789		301	321,822	D13—	107	321,855	D15—	5	321,887		220	321,919		107	321,951
		321,790		334	321,824		119	321,856			321,888			321,920	D28—	35	321,952
	77	321,791	D9—	310	321,825		136	321,857		17	321,889		234	321,921		48	321,953
	104	321,792		314	321,823		146	321,859		70	321,890		244	321,922		57	321,954
D4—	135	321,793		345	321,826		147	321,858		72	321,891		252	321,923		64.1	321,955
D6—	323	321,794		370	321,827			321,860		122	321,892		253	321,924	D29—	7	321,956
	328	321,795			321,828		150	321,861			321,893	D22—	140	321,925		9	321,957
	330	321,796		403	321,829		155	321,862		139	321,894	D23—	223	321,926		16	321,958
	381	321,797		434	321,830			321,863	D16—	102	321,895		231	321,927	D30—	121	321,959
	457	321,799	D10—	7	321,831	D14—	100	321,864			321,896		245	321,928	D32—	35	321,960
	462	321,798		14	321,832			321,865		209	321,897		294	321,931		38	321,961
	472	321,800		30	321,833		106	321,866	D18—	26	321,903		305	321,929		49	321,962
	492	321,801		39	321,834		118	321,867		49	321,901		360	321,930		58	321,963
	510	321,802			321,835			321,868			321,902		366	321,932	D34—	15	321,964
	518	321,803			321,836		121	321,869		55	321,898		377	321,933		23	321,965
	566	321,804		126	321,837		130	321,870		56	321,900		388	321,934		27	321,966
	611	321,805			321,838		151	321,871		58	321,899		413	321,935		44	321,967
D7—	308	321,806	D11—	33	321,840												

CLASSIFICATION OF PLANTS

P.—	9	7,717		54	7,719		7,721		69	7,723		78	7,725	
	20	7,718		68	7,720		7,722		74	7,724		86	7,726	88 7,727

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

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5,067,270
5,067,667
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04 : 5,067,218
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DESIGN PATENTS

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	321,888		321,924		321,904	321,862	37 : 321,793	321,922
06 :	321,792		321,925		321,906	321,863	38 : 321,963	48 : 321,821
	321,801		321,935		321,940	321,915	39 : 321,780	321,840
	321,802		321,938	13 :	321,817	321,926	321,781	321,886
	321,822		321,941		321,889	29 : 321,800	321,782	321,892
	321,850		321,949		321,931	321,937	321,806	321,898
	321,855		321,956	17 :	321,794	33 : 321,798	321,815	321,918
	321,867	08 :	321,791		321,861	34 : 321,833	321,827	321,921
	321,868		321,824		321,957	321,879	321,852	321,933
	321,878	09 :	321,785	18 :	321,825	321,880	321,917	321,952
	321,881		321,807		321,870	321,928	321,932	51 : 321,774
	321,887		321,830		321,959	36 : 321,813	41 : 321,776	321,775
	321,894		321,903	19 :	321,893	321,814	321,865	321,916
	321,899		321,936	25 :	321,778	321,831	321,927	321,965
	321,908	12 :	321,784		321,857	321,851	42 : 321,804	321,966
	321,909		321,789		321,864	321,853	321,826	53 : 321,854
	321,910		321,790		321,953	321,883	321,896	55 : 321,796
	321,911		321,805		321,958	321,895	321,955	321,929
	321,912		321,856	26 :	321,795	321,897	321,962	321,947
	321,919		321,877		321,866			

PLANT PATENTS

06 :	7,717					
	7,722	7,723	7,726	12 : 7,719	36 : 7,724	7,725

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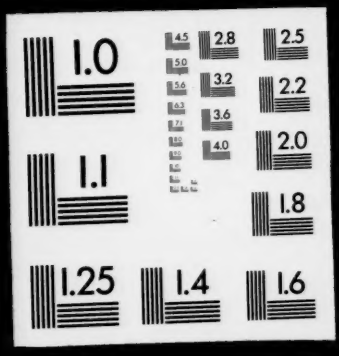
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